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**Fritsch**

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(45) Date of Patent: **Jun. 12, 2001**

(54) **DISTRIBUTION OF MUSICAL PRODUCTS  
BY A WEB SITE VENDOR OVER THE  
INTERNET**

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\* cited by examiner

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U.S.C. 154(b) by 0 days.

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(22) Filed: **Jan. 18, 2000**

**Related U.S. Application Data**

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1999, provisional application No. 60/116,910, filed on Jan.  
22, 1999, provisional application No. 60/116,779, filed on  
Jan. 22, 1999, provisional application No. 60/116,917, filed  
on Jan. 22, 1999, provisional application No. 60/116,780,  
filed on Jan. 22, 1999, and provisional application No.  
60/116,778, filed on Jan. 22, 1999.

(51) Int. Cl.<sup>7</sup> ..... **H06F 1/24**

(52) U.S. Cl. .... **713/171; 713/160; 713/161;**  
**380/255; 380/258.**

(58) Field of Search ..... **380/255, 258,**  
**380/283, 28; 713/160, 161, 168, 170, 171**

(56) **References Cited**

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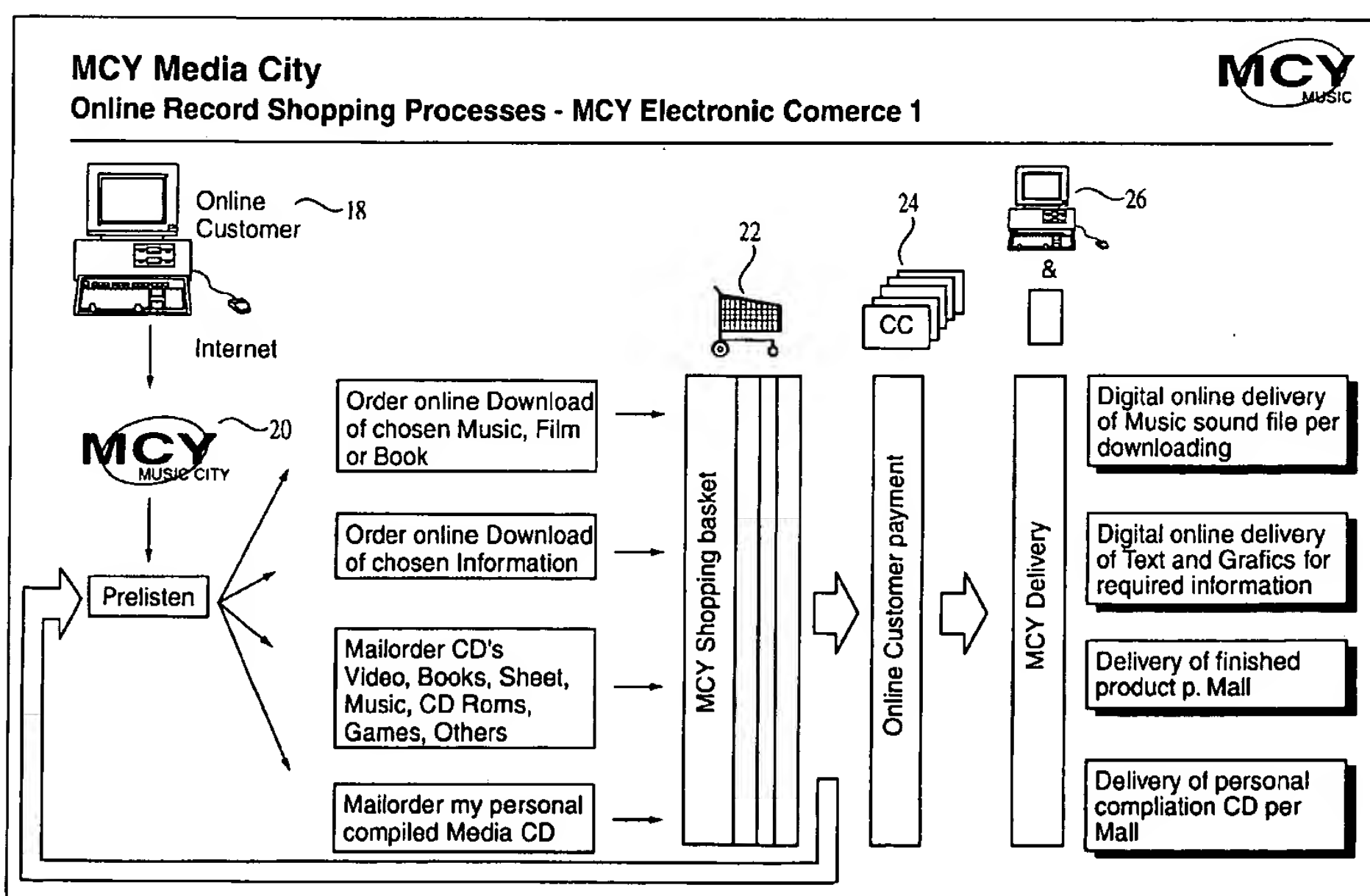
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Felder & Steiner LLP

(57) **ABSTRACT**

The system and method permit the purchase of audio music files over the Internet. The PC user logs onto the vendor's web site and browses the songs available for purchase. The songs can be arranged by artist, music style, etc., as mentioned above. Further, the vendor can provide suggestions on the web site, directing the PC user to songs that might be desirable, based on that PC user's previous purchases, her indicated preferences, popularity of the songs, paid advertising and the like. If interested in a song, the PC user has the option of clicking on a song to "pre-listen" to it—hearing a 20-second clip, for example. If the PC user then wishes to purchase the song, she can submit her order by clicking on the icons located next to each song/album. The order will be reflected in the shopping basket, always visible on the screen. As the PC user selects more items, each and every item is displayed in the shopping basket. At any point in time, the PC user can review her selections, deleting items she no longer desires.

**14 Claims, 24 Drawing Sheets**



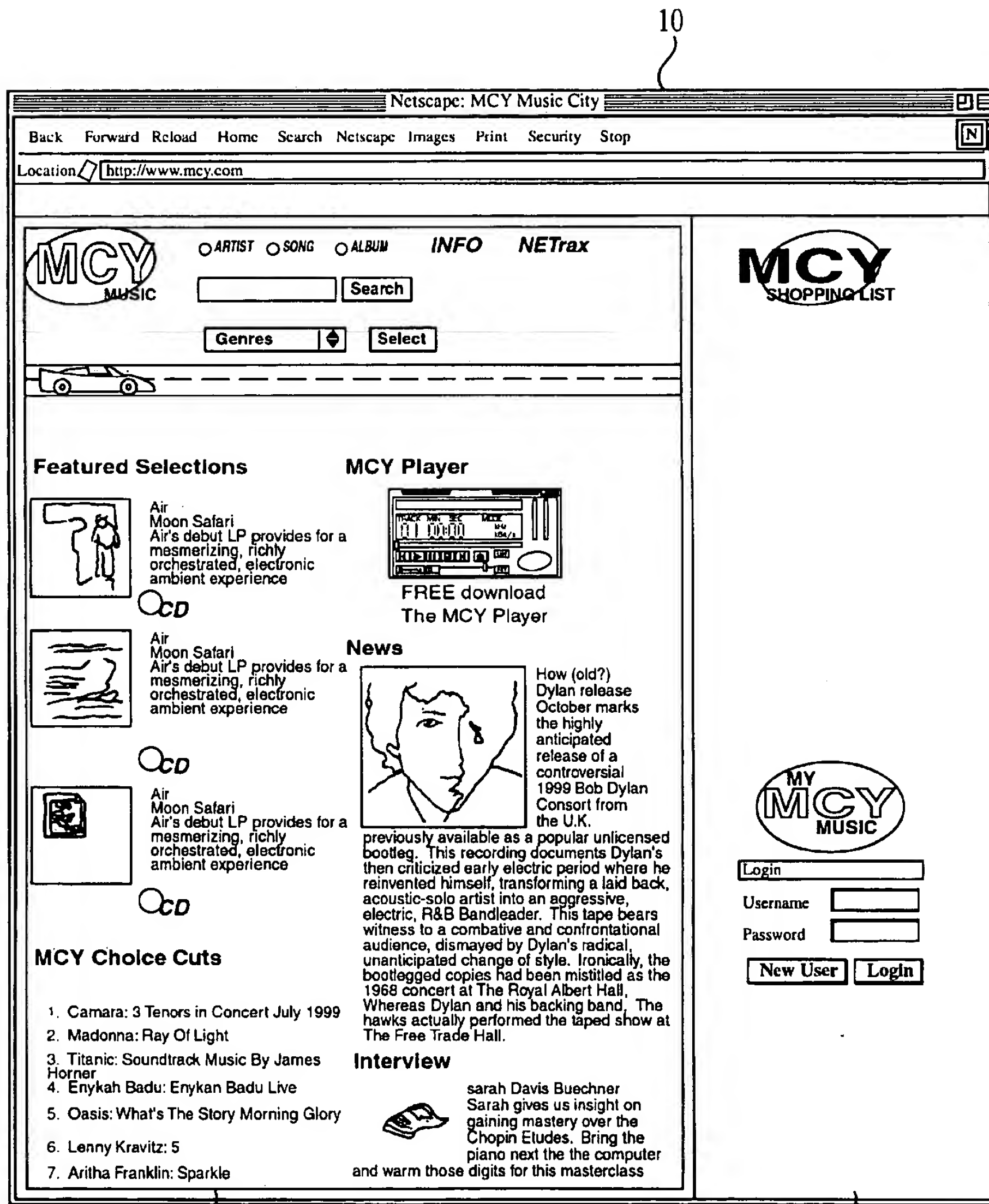


FIG. 1A

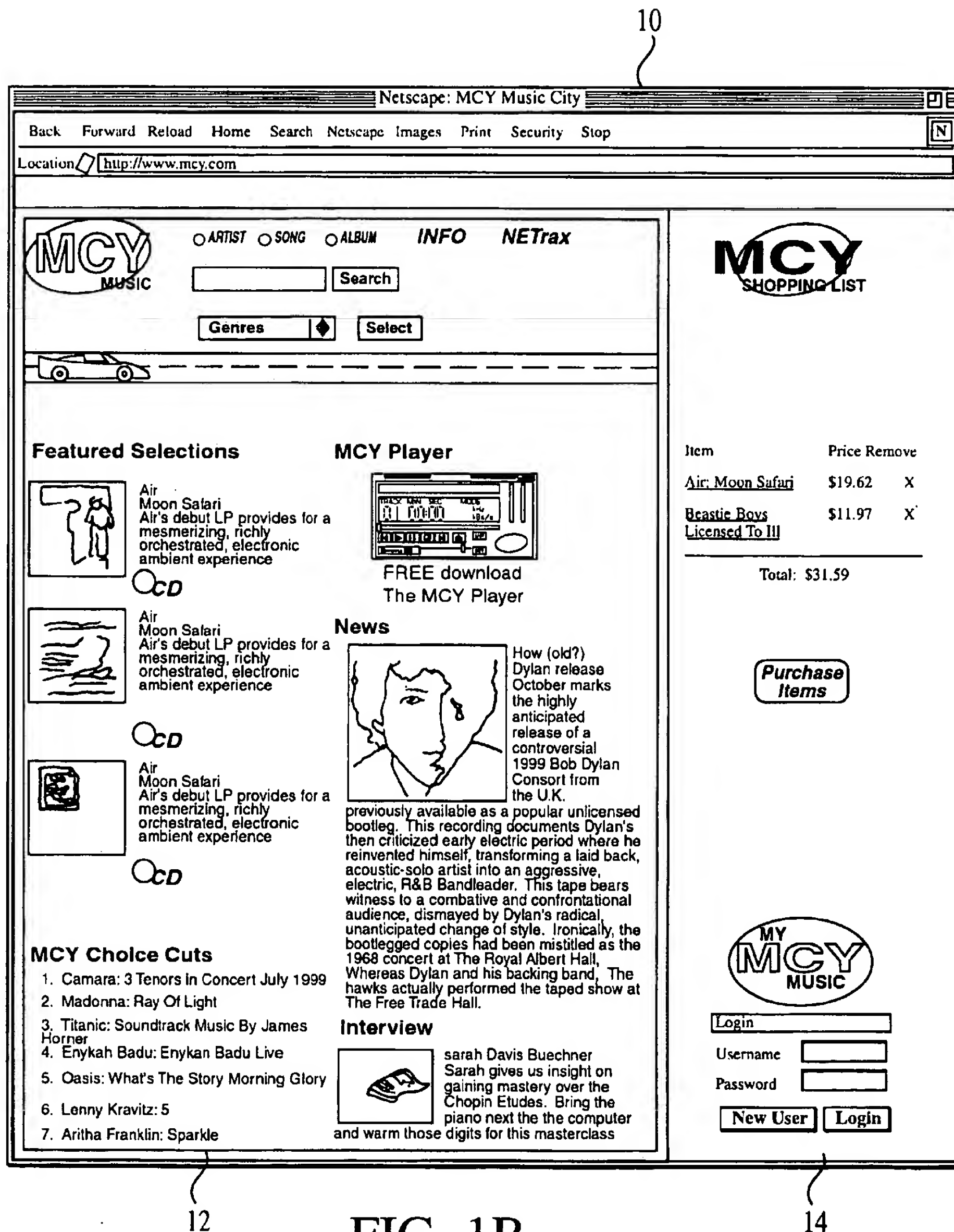


FIG. 1B

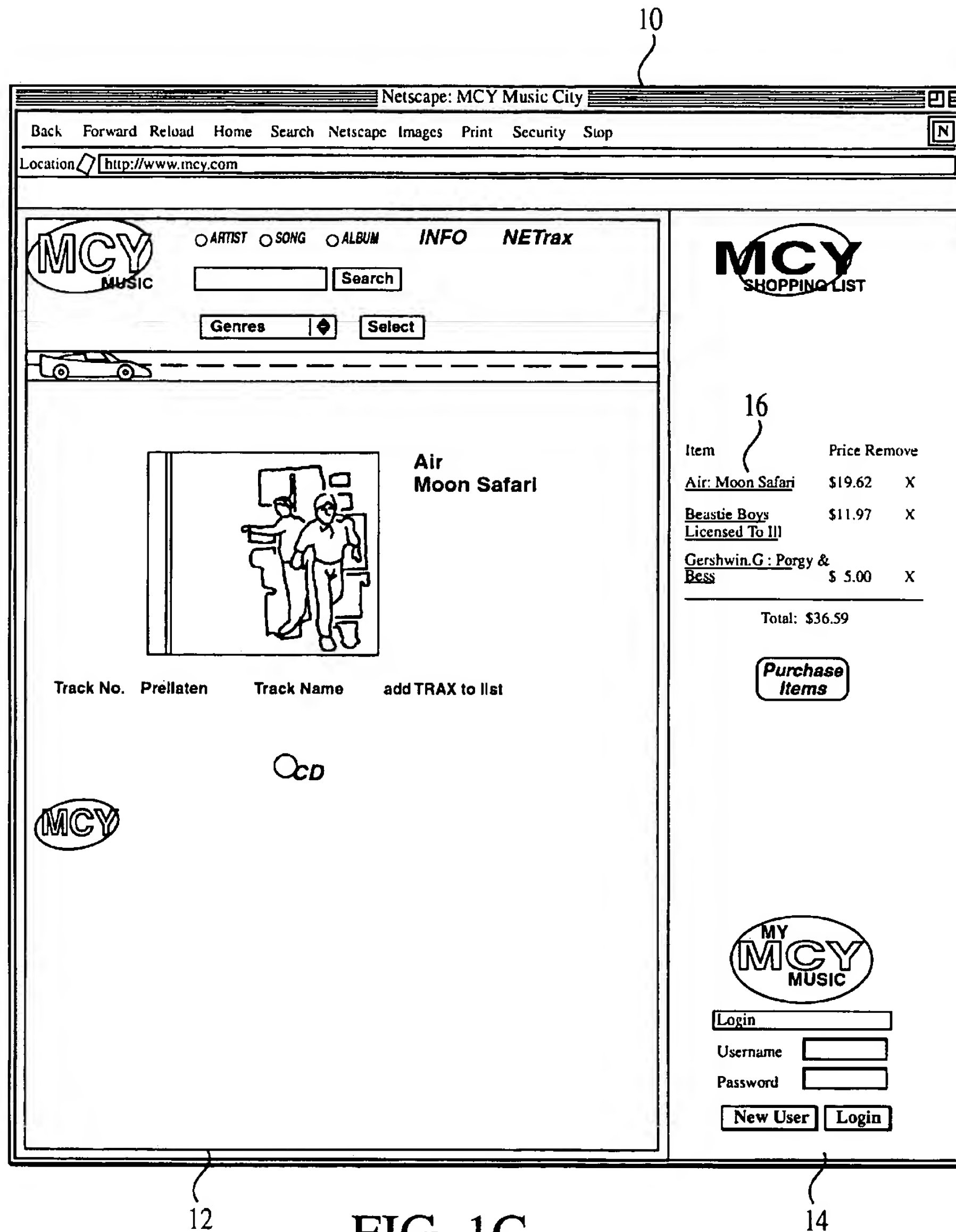


FIG. 1C

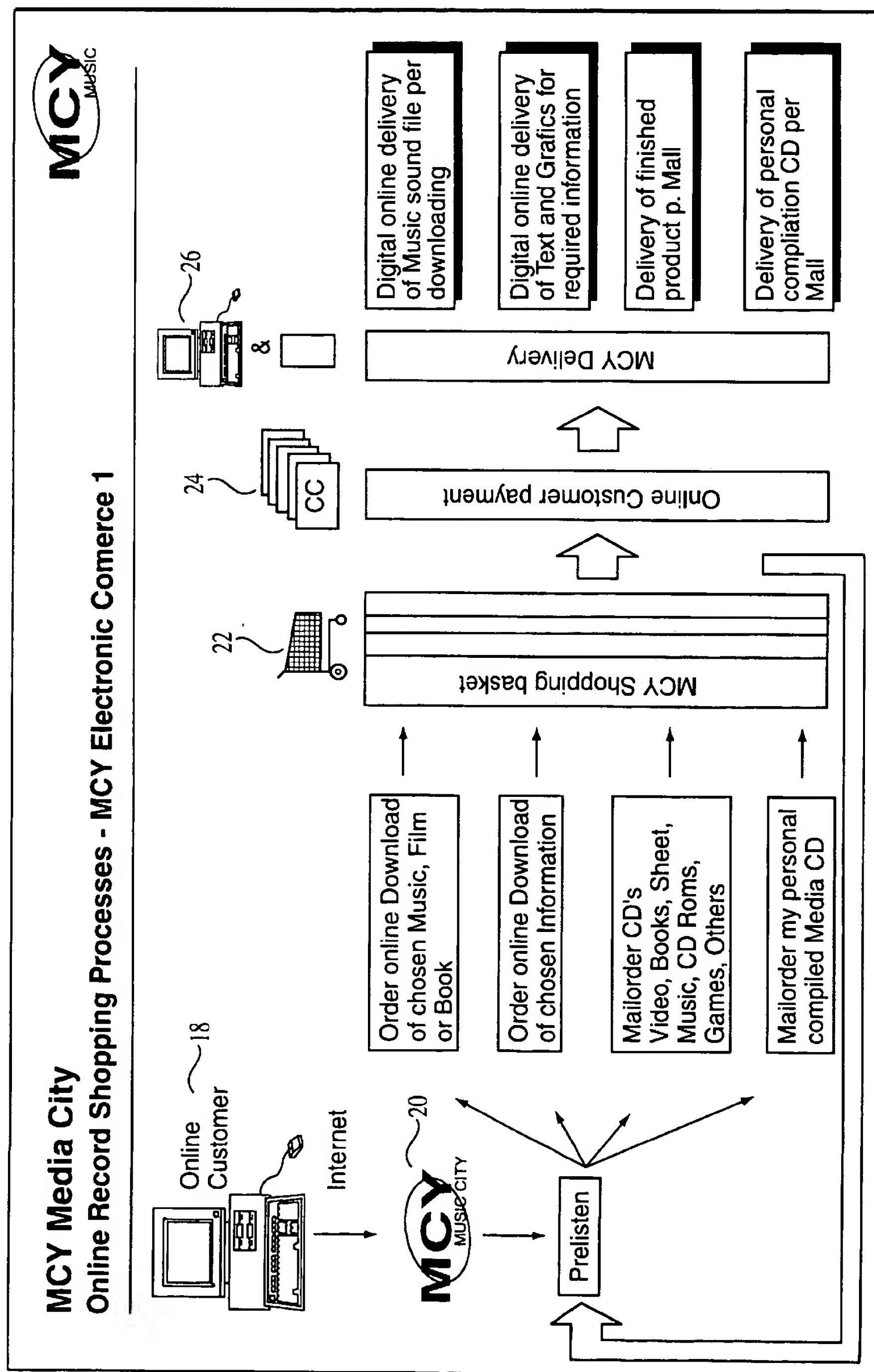

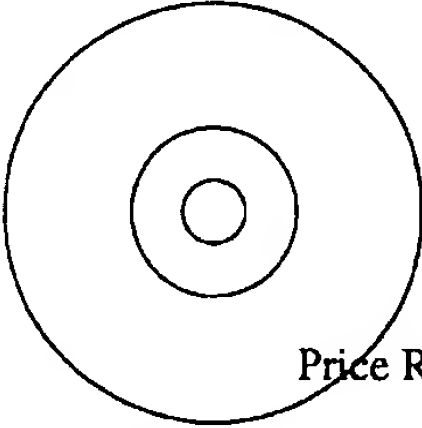


FIG. 1D

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Item	Price	Remove
<u>Air: Moon Safari</u>	\$19.62	X
<u>Beastie Boys</u> <u>Licensed To Ill</u>	\$11.97	X
<u>Gershwin.G : Porgy &amp; Bess</u>	\$ 5.00	X

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Total: \$36.59

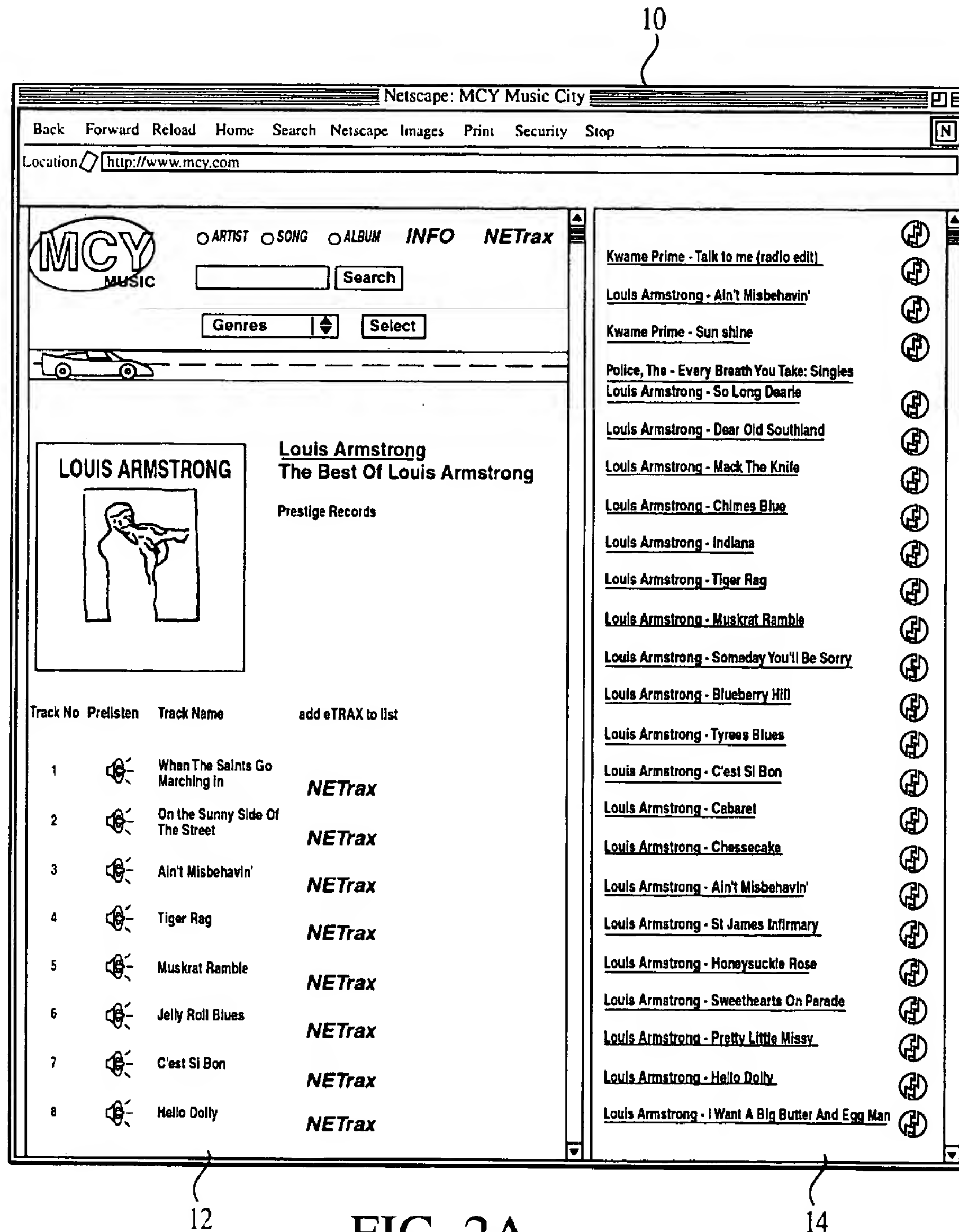




Username

Password

FIG. 1E



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FIG. 2B



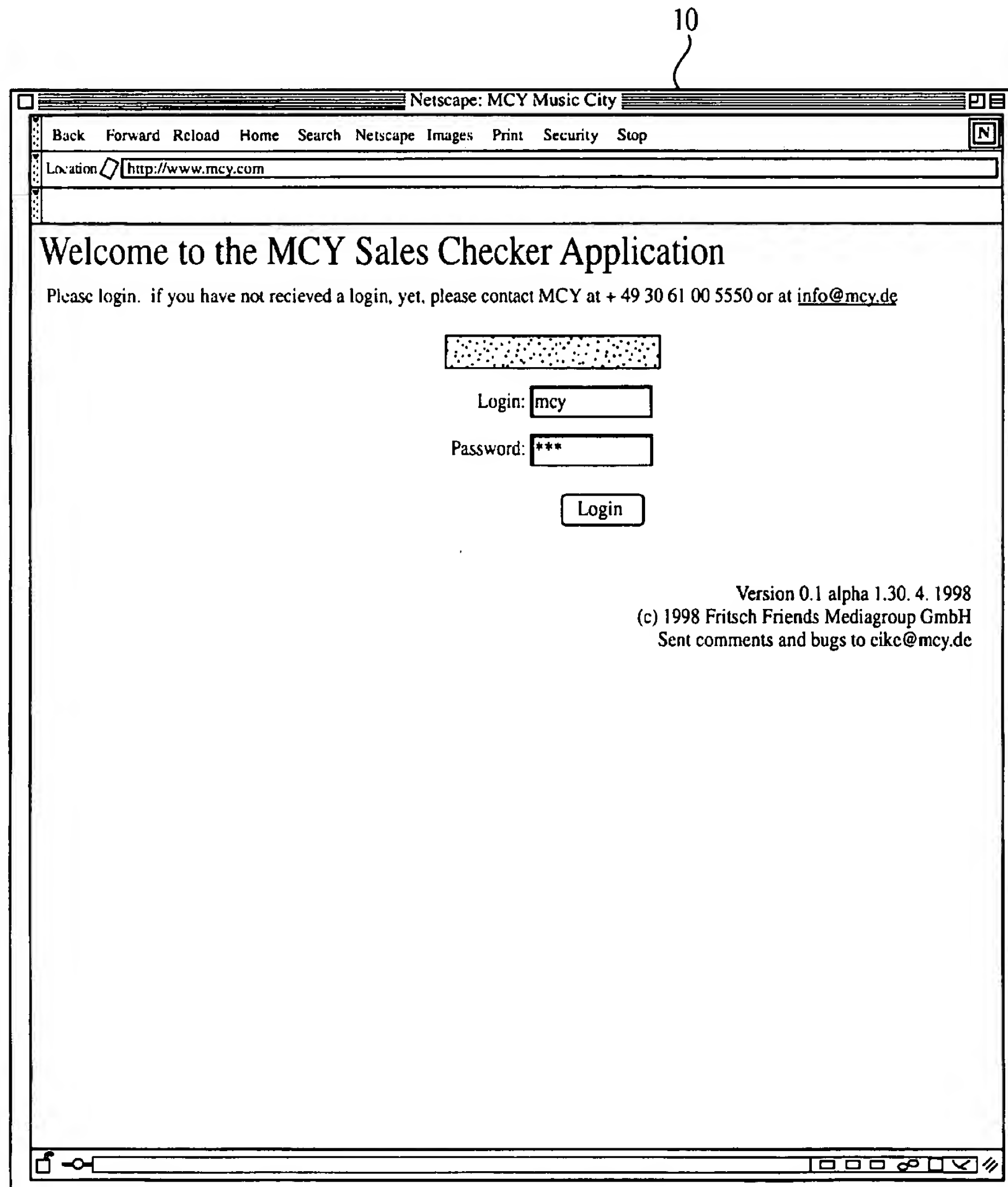


FIG. 3A

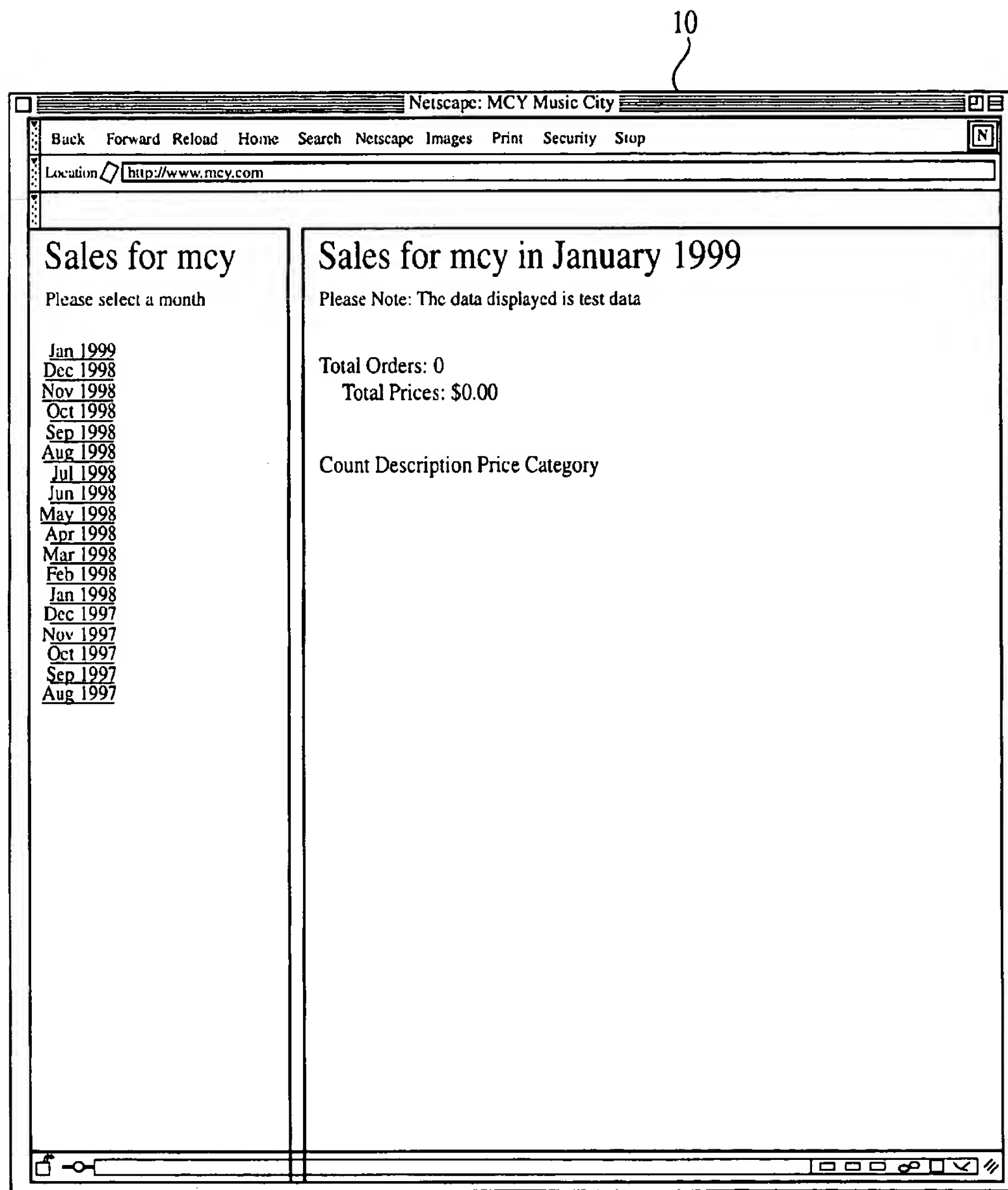


FIG. 3B

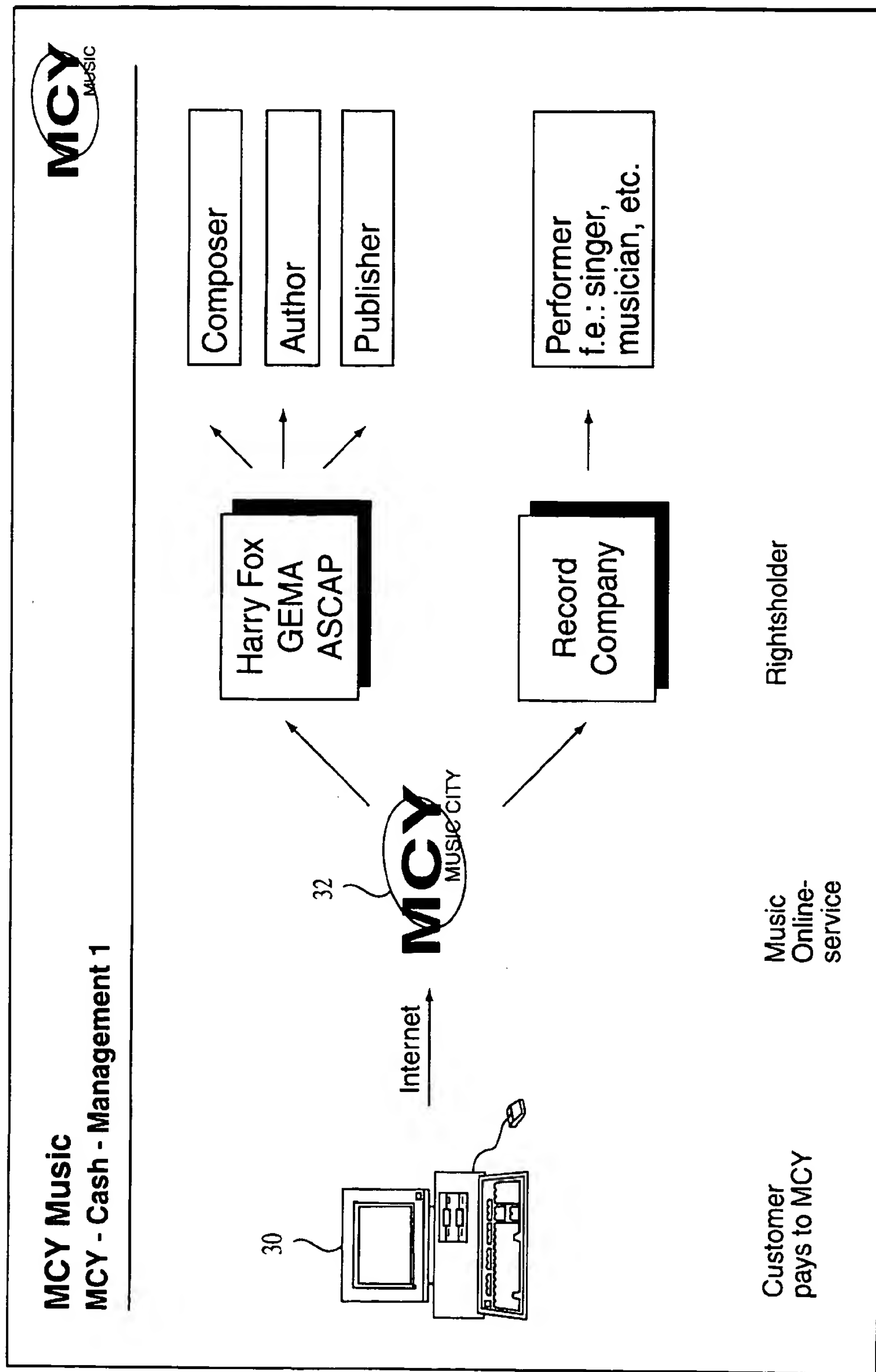


FIG. 3C

# NETrax

FIG. 4A

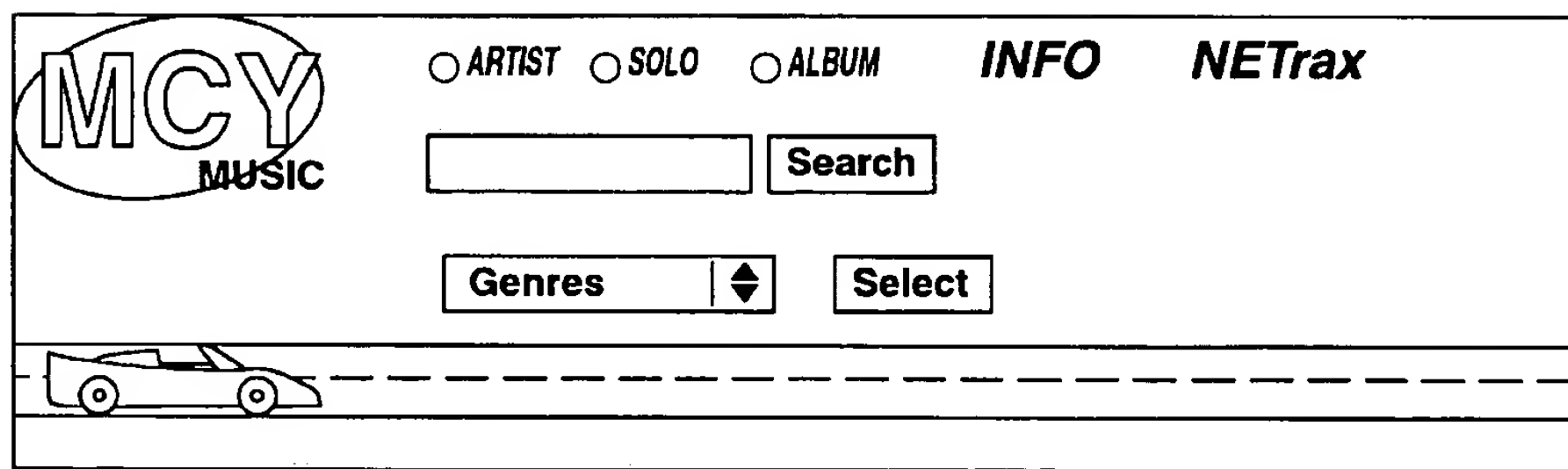


FIG. 4C

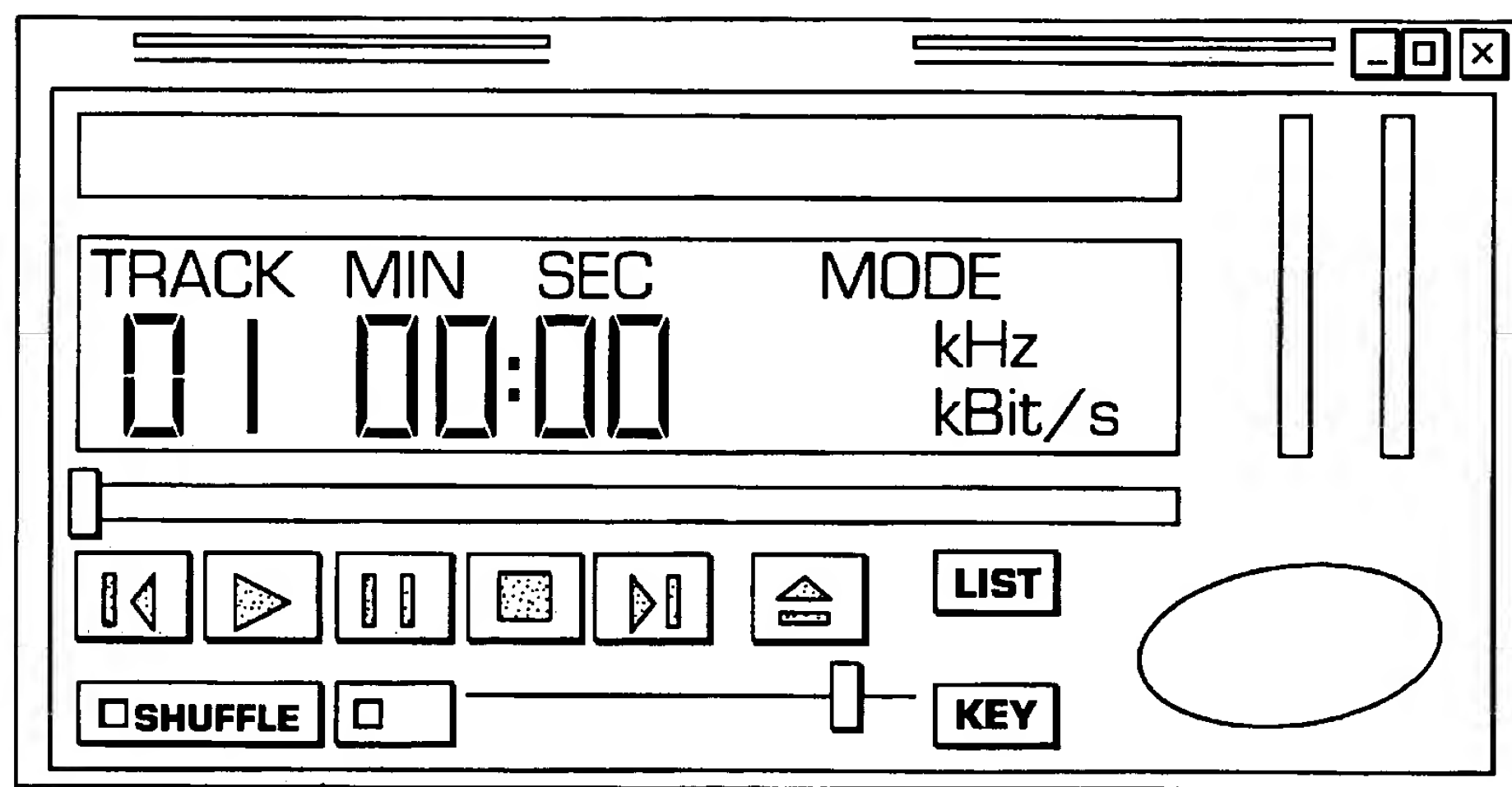


FIG. 4B

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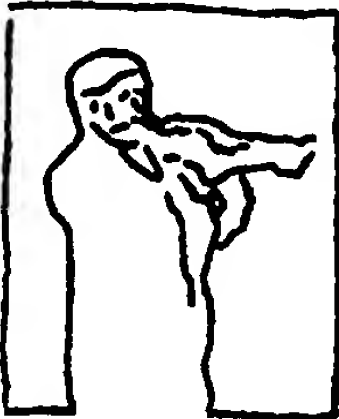










<b>LOUIS ARMSTRONG</b>		<b><u>Louis Armstrong</u></b> <b>The Best Of Louis Armstrong</b> <b><u>Prestige Records</u></b>	
			
Track No.	Prelisten	Track Name	add eTRAX to list
1		When The Saints Go Marching in	<b>NETrax</b>
2		On the Sunny Side Of The Street	<b>NETrax</b>
3		Ain't Misbehavin'	<b>NETrax</b>
4		Tiger Rag	<b>NETrax</b>
5		Muskrat Ramble	<b>NETrax</b>
6		Jelly Roll Blues	<b>NETrax</b>
7		C'est Si Bon	<b>NETrax</b>
8		Hello Dolly	<b>NETrax</b>
9		Mack The Knife	<b>NETrax</b>
10		Kiss To Build A Dream On	<b>NETrax</b>

FIG. 4D

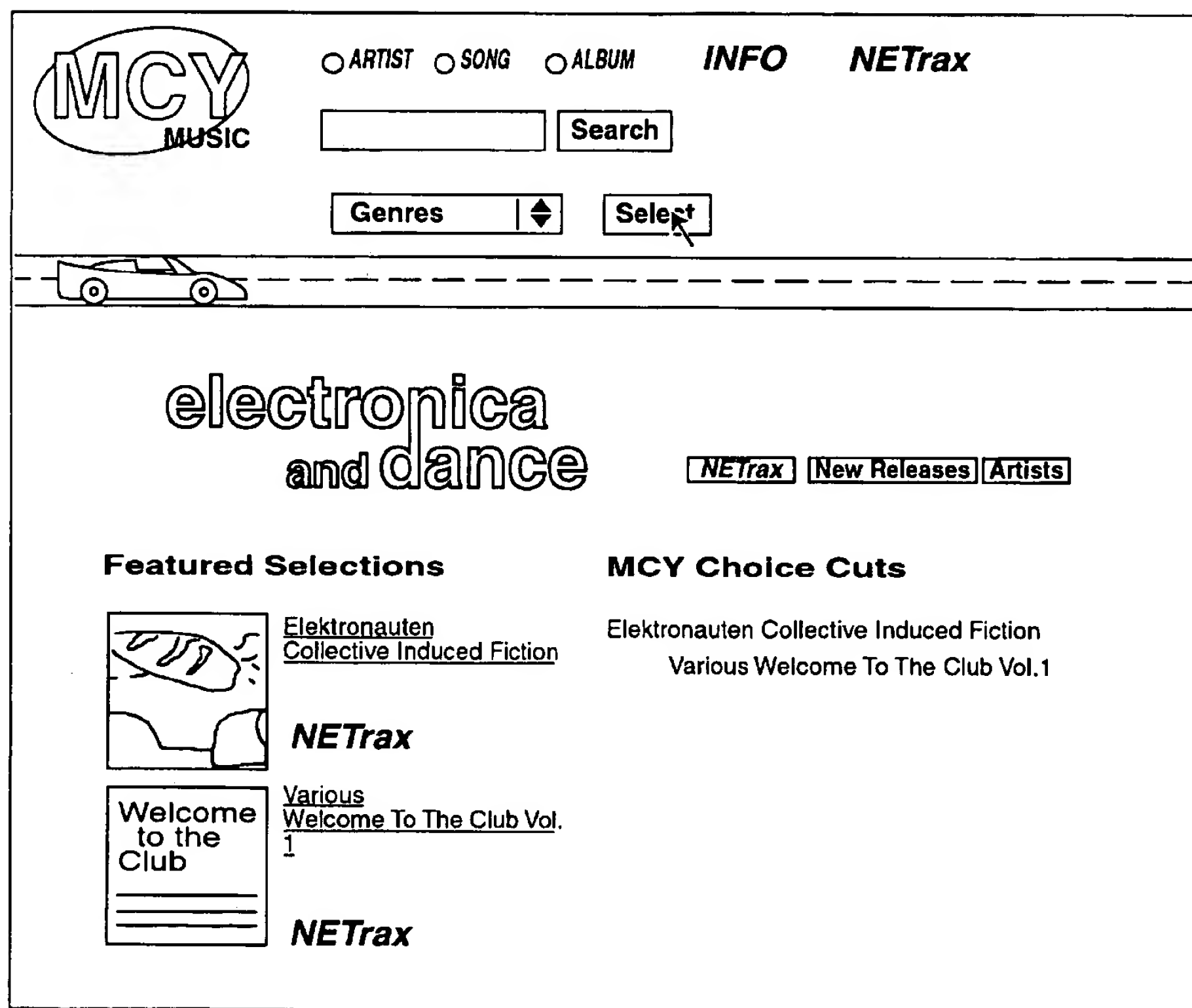


FIG. 4E

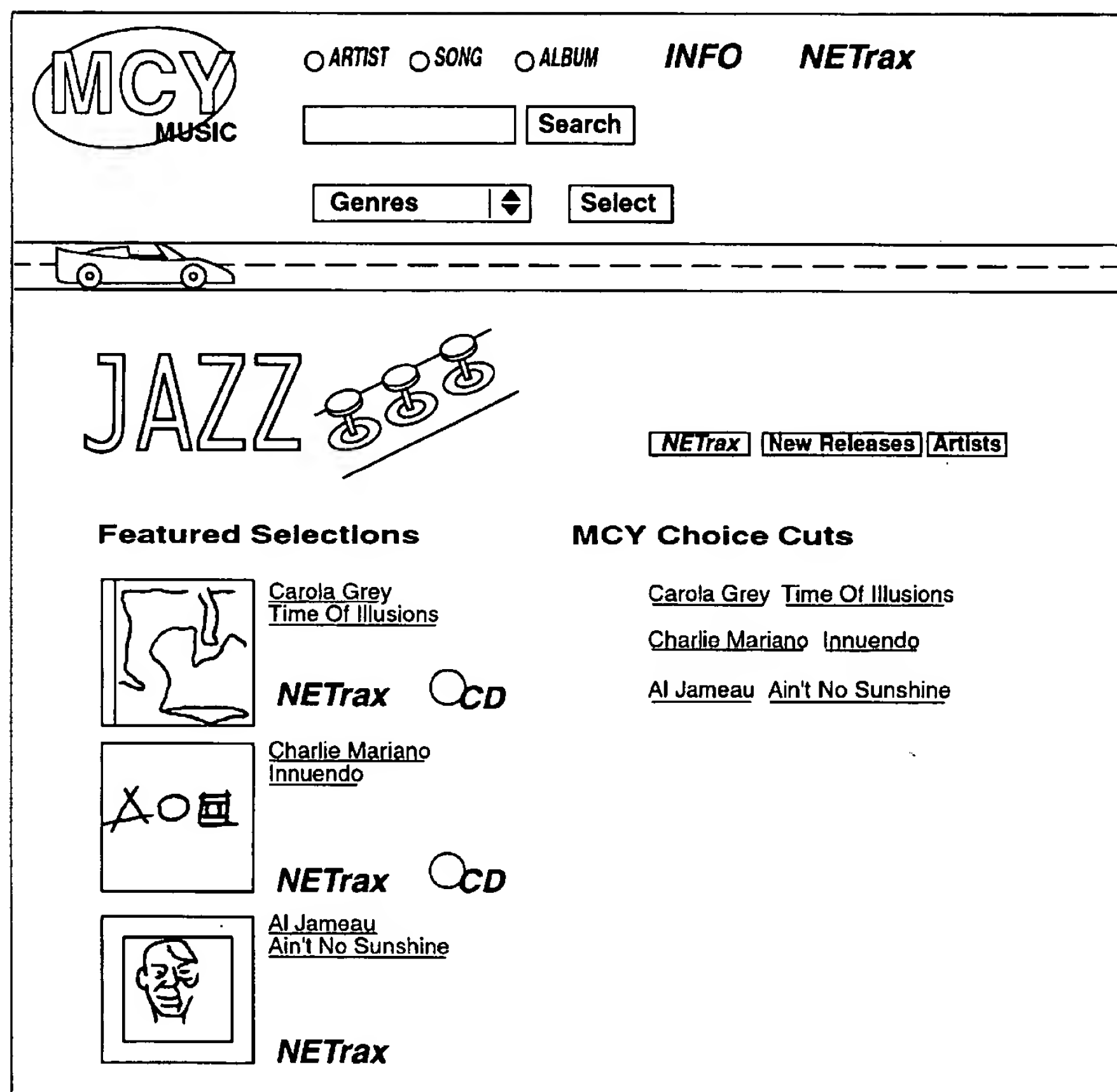


FIG. 4F



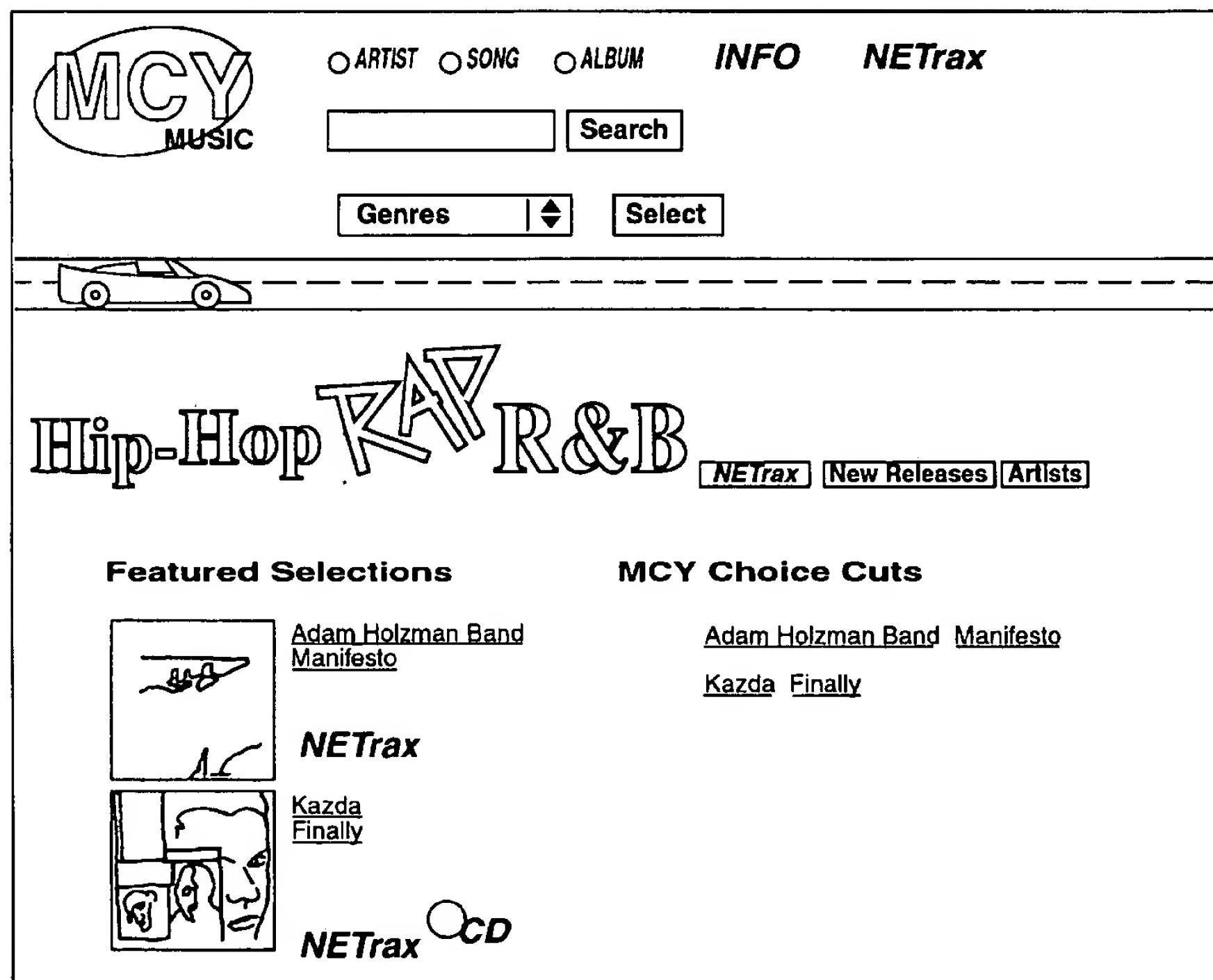


FIG. 4G

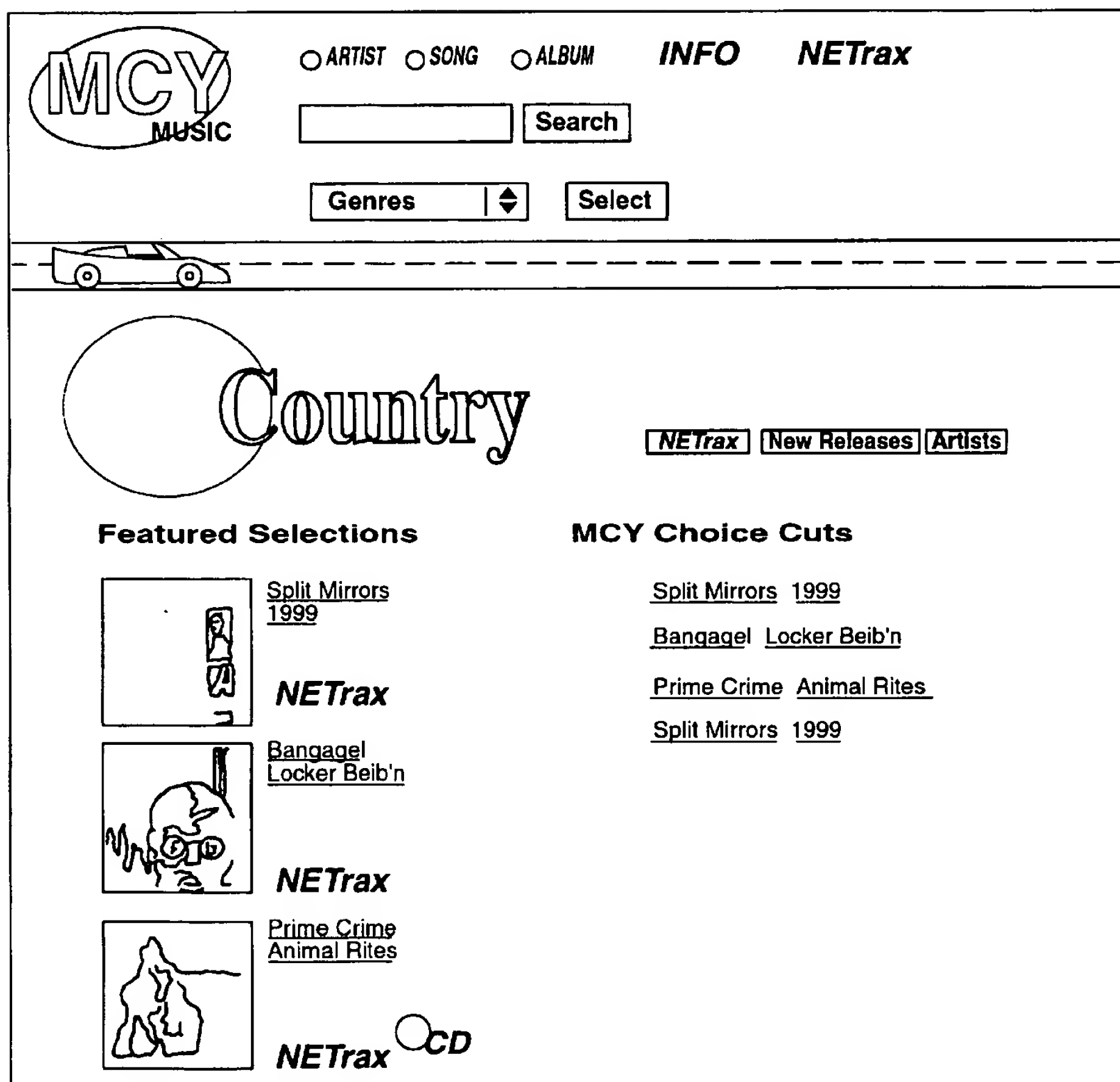


FIG. 4H

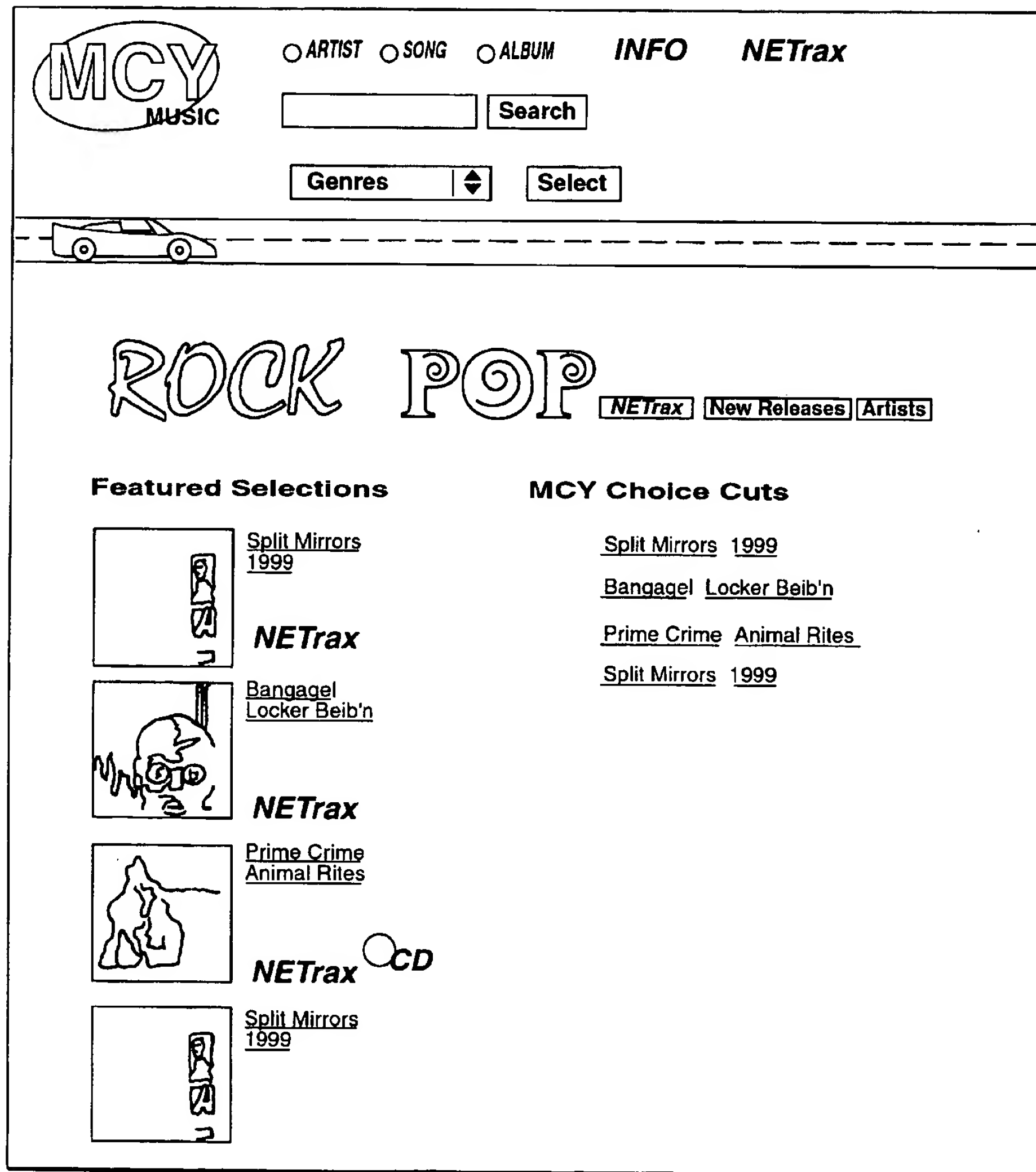


FIG. 4I

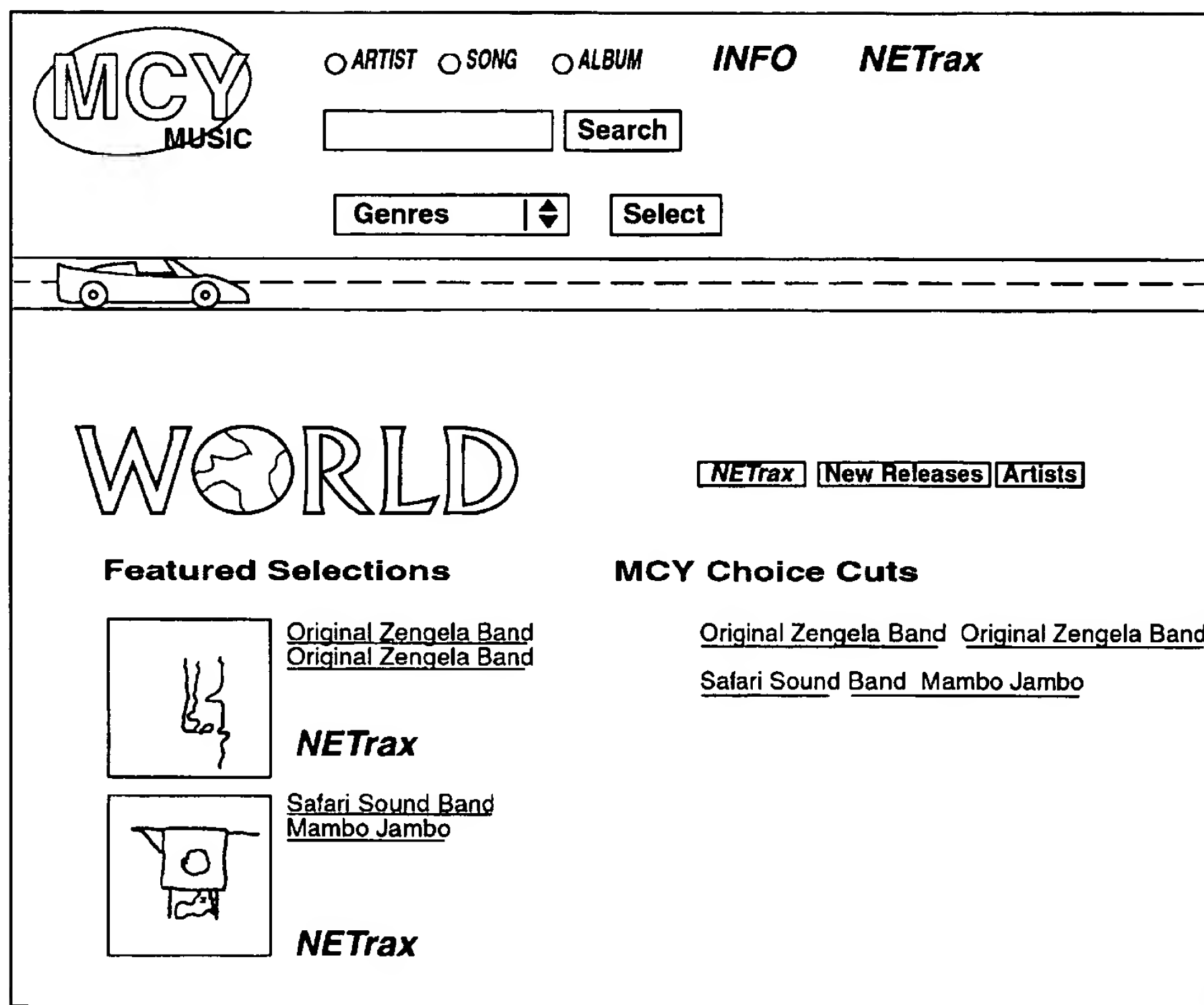


FIG. 4J

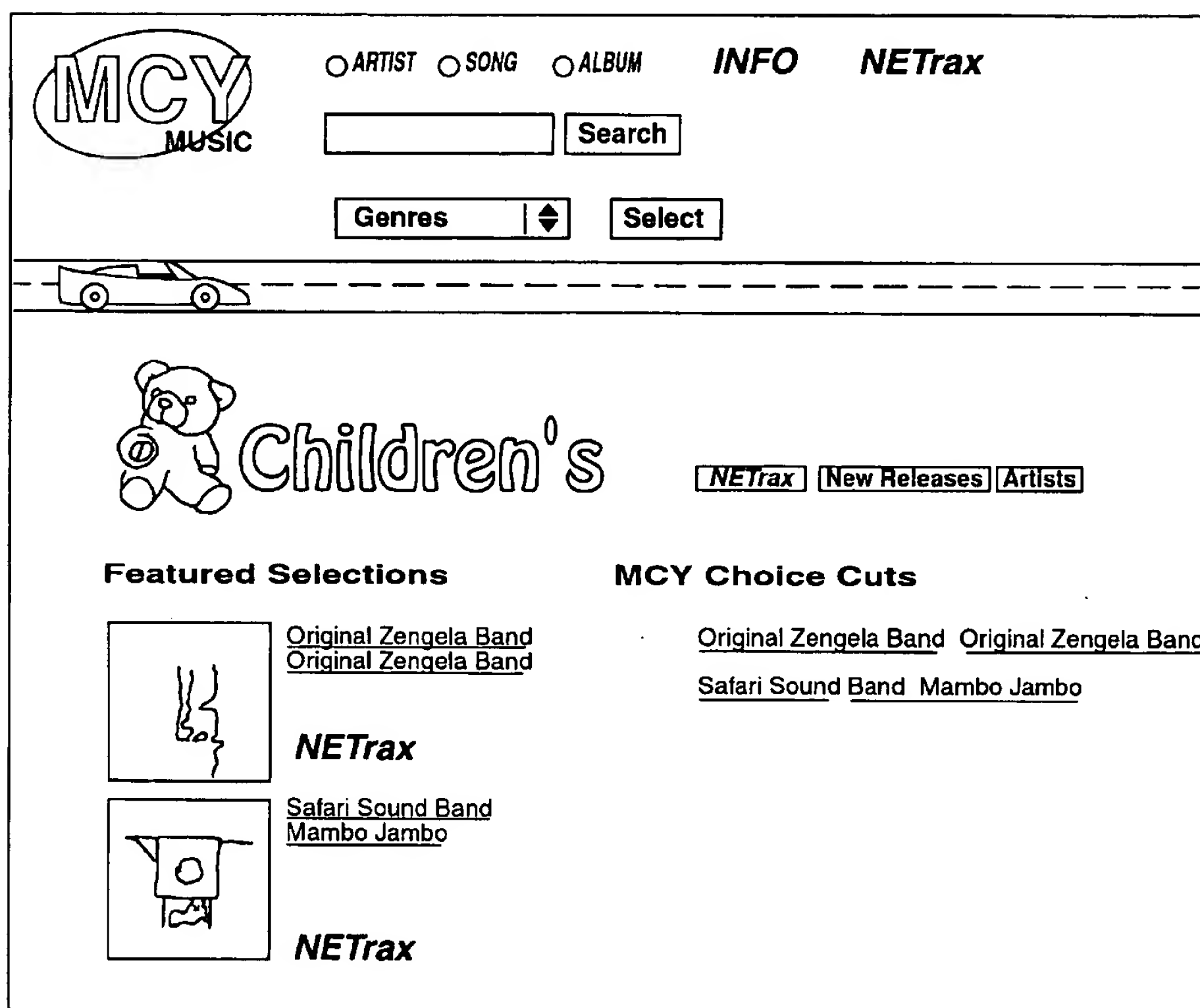


FIG. 4K

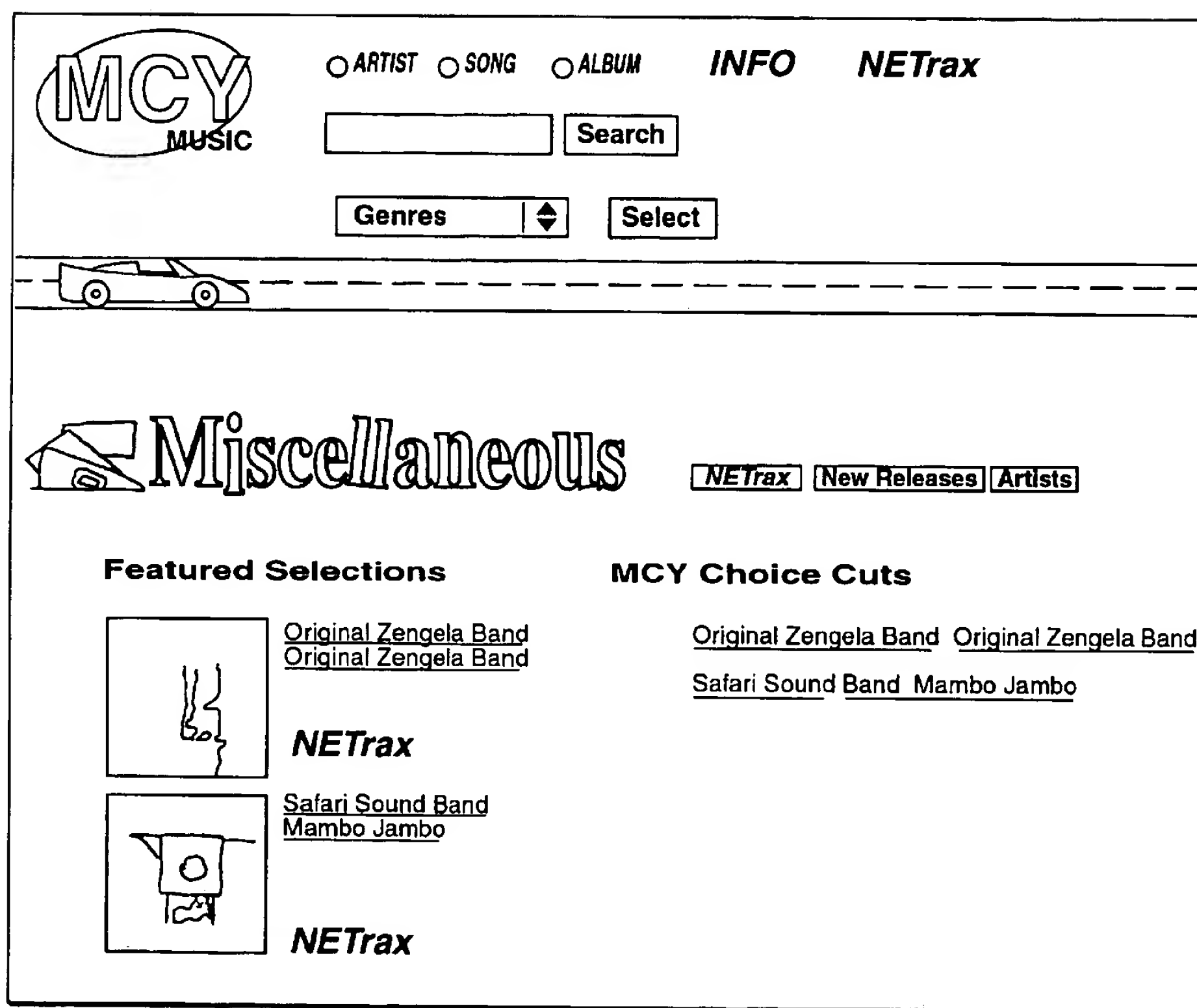


FIG. 4L

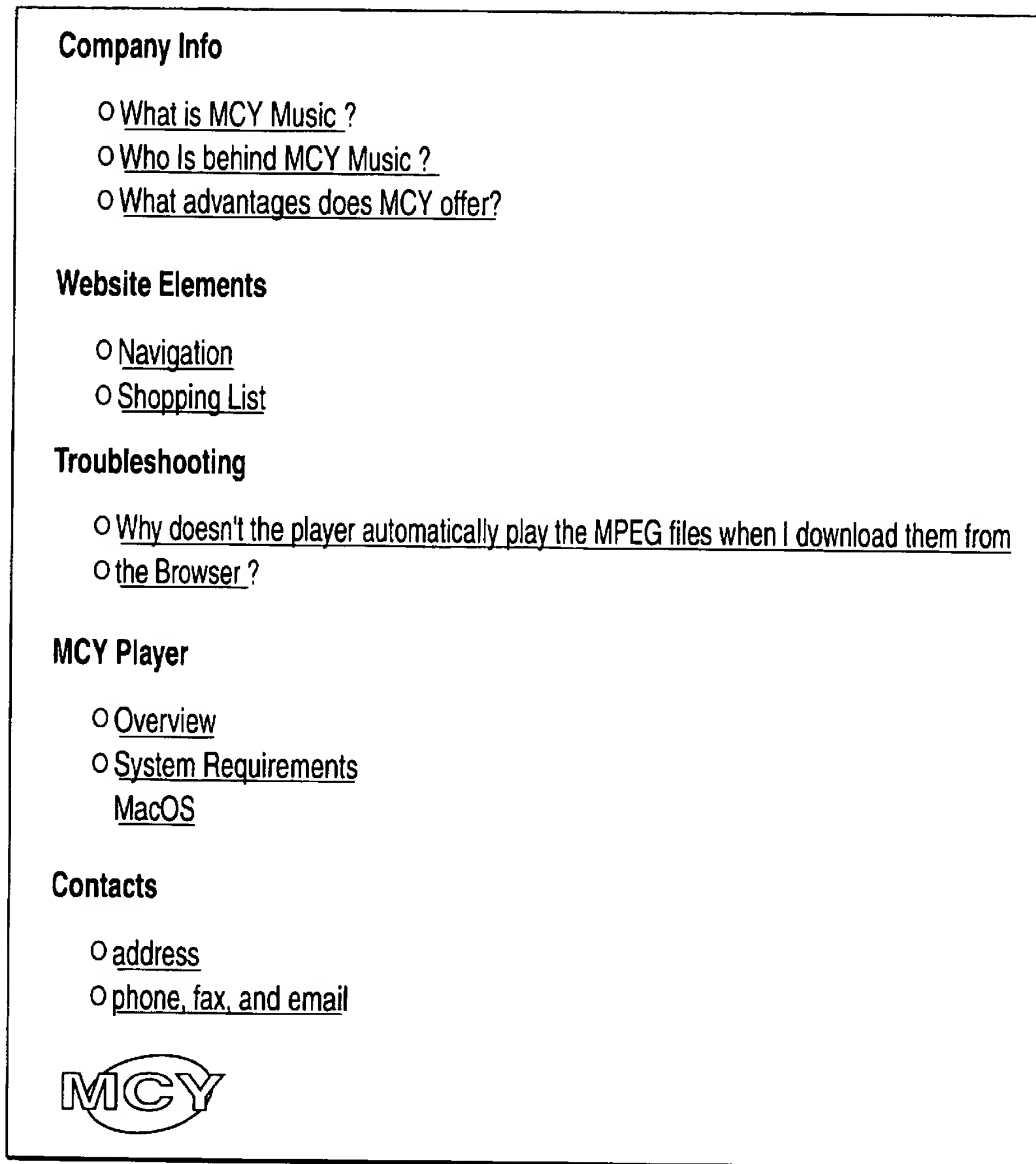


FIG. 5

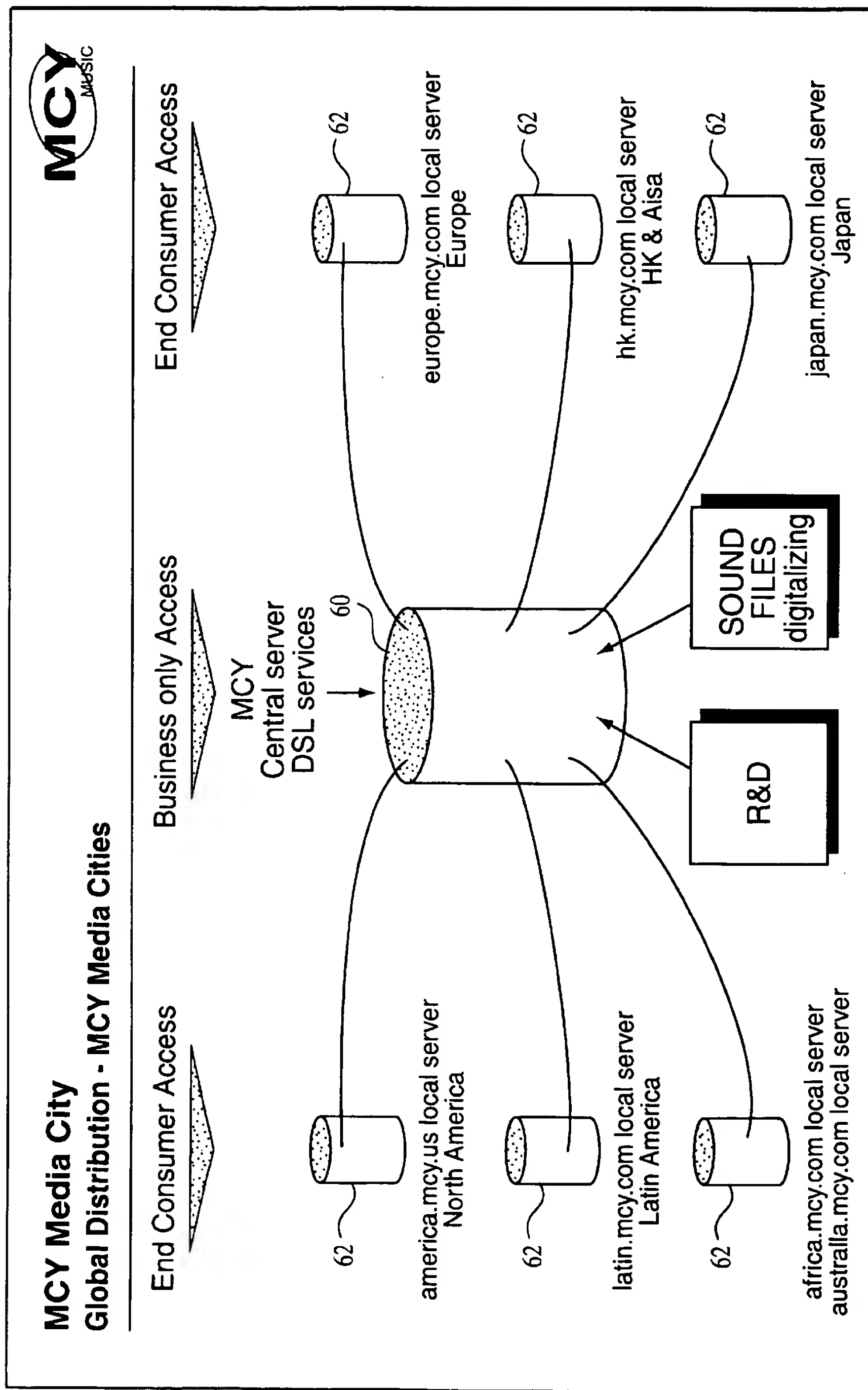



FIG. 6



<b>MCY MediaCity</b> <b>The server setup 1 - MCY Media Direct</b>		
<b>MCY - Systems</b>		<b>MCY - Products</b>
<b>GUI</b>		
graphic user interface	MCY MediaCity	
Linkage to Database	MCY Interface Structure	
Product Database	MCY License controller, MCY Jukebox	
Payment System	MCY Sales Controller, MCY Worldwide Payment System	
Customer Database	MCY Customer Database/MCY Eletronical Customer Service	
Media Database	MCY Media Player, MCY Audio Files, MCY Video Files, MCY Encryption MCY Datacompression, MCY Audio Streaming, MCY Download Delivery	
Server Software	MCY Platform, MCY Technology	
Hardware	Type: Sun E 4000	

**FIG. 7**

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# **DISTRIBUTION OF MUSICAL PRODUCTS BY A WEB SITE VENDOR OVER THE INTERNET**

## **CROSS-REFERENCE TO RELATED APPLICATIONS**

This application claims the benefit of U.S. Provisional Application No. 60/116,918, filed on Jan. 22, 1999; U.S. Provisional Application No. 60/116,910, filed on Jan. 22, 1999; U.S. Provisional Application No. 60/116,779, filed on Jan. 22, 1999; U.S. Provisional Application No. 60/116,917, filed on Jan. 22, 1999; U.S. Provisional Application No. 60/116,780, filed on Jan. 22, 1999; and U.S. Provisional Application No. 60/116,778, filed on Jan. 22, 1999.

## **BACKGROUND OF THE INVENTION**

The present invention relates generally to digital music downloading. More particularly, the present invention relates to a system and method for distributing digital music over the Internet by a web site vendor.

The Internet has offered opportunities for electronic commerce of massive proportions. Among other things, distribution of music over the computer-implemented global network is a well suited application of e-commerce, whereby consumers can easily and quickly find and purchase individual tracks or entire albums. A need therefore exists for a system and method that provide a music web site that is comprehensive, versatile, user-friendly, and protects the proprietary rights of artists and other rights holders.

## **BRIEF SUMMARY OF THE INVENTION**

It is an object of the present invention to provide a digital music distribution web site.

It is another object of the present invention to provide a digital music distribution web site wherein a customer shopping list is always visible on a display screen.

It is yet another object of the present invention to display a shopping history for each registered user/customer for unlimited downloading of the previously purchased items.

It is still another object of the present invention to display a sales and royalty history for rights holders based on the sales of the product via the web site.

It is still another object of the present invention to prohibit an unauthorized transfer of downloaded music files for playback by an unregistered user/customer.

The above and other objects are achieved by a system and method for digitally distributing music comprised of tracks and albums over the Internet to a plurality of the Internet users. According to the present invention, a key is assigned to a track for downloading to a user, and the assigned key is inserted into the track prior to the downloading. The same assigned key is transferred to the user prior to downloading the track. The transferred key is combined with additional data to generate an identifier that uniquely identifies a customer's computer. It is then verified whether the key extracted from the downloaded track matches the information based on the generated identifier to enable the playback of the track.

In accordance with one aspect of the present invention, the assigned key is unique to the user in correspondence to a username and password combination, and the user enters the username and password combination to access the track in a database prior to the assignment of the key.

In accordance with another aspect of the present invention, the track is downloaded only if the user purchases the track prior to the downloading.

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## **BRIEF DESCRIPTION OF THE DRAWINGS**

The present invention is illustrated in the figures of the accompanying drawings which are meant to be exemplary and not limiting, in which like reference characters refer to like or corresponding parts, and in which:

FIG. 1A shows an illustration of the video display screen as viewed by the PC user after connecting to the vendor's web site for distributing musical products;

FIG. 1B shows an illustration of the video display screen after the PC user's login has been successfully completed;

FIG. 1C illustrates an option for the PC user to click on a song to "pre-listen" to it—hearing a 20-second clip, for example;

FIG. 1D is a block diagram of the network-based music distribution system according to the present invention;

FIG. 1E illustrates in detail the shopping basket containing the desired items;

FIG. 2A shows an illustration of the monitor screen displaying another feature of the network-based system according to the present invention;

FIG. 2B shows in detail the records reflecting previous purchases listed under the "Past Orders" sub-heading;

FIG. 3A shows an illustration of the monitor screen displaying the user interface for accessing the information on royalties;

FIG. 3B shows royalty information maintained as a historical record (showing all the royalties earned to date) or as an incremental record (showing all the royalties currently outstanding);

FIG. 3C is a block diagram of the sales sub-system for determining sales and royalties for the rights-holders in accordance with the present invention;

FIG. 4A shows the name of the encoding format for digital music in accordance with the present invention;

FIG. 4B shows a portion of the screen displaying a music player for listening to the downloaded music in the NETrax or MP3 format;

FIG. 4C shows a portion of the screen displaying the user interface for the web site for distributing digital or analog music according to the present invention; FIG. 4D shows a screen display whereby the search is performed by an album;

FIGS. 4E–4L show screen displays in response to the PC user search by different genres, such as electronica and dance, jazz, hip-hop, rap, R&B, country, rock and pop, world, children's and miscellaneous;

FIG. 5 shows a screen displaying a page for various other portions of the web site, whereby additional information may be obtained by clicking on the displayed heading or sub-heading;

FIG. 6 shows a block diagram of the database structure in accordance with the present invention; and

FIG. 7 is a block diagram of various software and hardware units (sub-systems), as well as database components, comprising the overall system of the present invention.

## **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

As a general overview, the present invention includes a system and method for maintaining a music web site on the Internet. Consumers may access the web site via a personal computer or any other wired or wireless Internet access

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device, such as WebTV, personal digital assistant, cellular telephone, etc., to obtain a variety of services and products. For instance, a consumer may browse through artists, tracks or albums, pre-listen to a portion of the song and purchase the selected song either by downloading the digital data to her computer hard drive or by placing a mail order for a compact disk (CD). A specially encoded or encrypted MP3 files called "NETrax" are delivered from a server over the Internet or cable services to the end consumers' home PC.

The present invention is directed to, among other things, a network-based system for distribution of musical products over a network, such as the Internet for example. The system includes a server platform for processing user requests and other information associated with the operation of the system. The server is connected to a database, which may be remote or local, for storing data. The stored data represents digitized songs, text associated with each song such as track name, album name, artist name, lyrics, etc., image data, graphics, etc.

The server is a node on a global computer-implemented network, such as the Internet. As known to those skilled in the art, a network router may be used to connect the server to the Internet for controlling the flow of data. Also connected to the Internet is a plurality of nodes, such as personal computers, Web devices, etc., under control by the users (hereinafter collectively referred to as PC users). The PC users communicate with the server using dial-up modems, cable modems, IDSN, DSL, etc., and using browser programs executing on their personal computers or other Internet-compatible devices, as well known to those skilled in the art. Communication links or sessions are established between the PC users and the server, via the Internet, when the PC users log onto the web site hosted by the server.

In the preferred embodiment, a PC user logs on to the Internet to access the World Wide Web portion thereof using a web browser program. That is, the PC user selects and enters a URL address for the vendor's web site on her computer, and a communication link is established between the PC user and the selected vendor's web site. The request from the browser goes out to the server using the Internet (HTTP) protocol. Using SQL commands, the server then accesses the database maintaining the requested URL address information, and the HTML-based results are transferred from the database to the server and subsequently to the client's browser for display on the PC user display monitor.

FIG. 1A shows an illustration of the video display screen 10 as viewed by the PC user after connecting to the vendor's web site for distributing musical products.

As shown in the figure, the web site display is divided into 2 portions: main portion 12 on the left side of the screen 10 contains fields for entering music-related search queries. For example, the PC user may search for desired songs by artist after entering the artist's name. The operation is carried out by various search engines for searching relational databases. Alternatively, the PC user may look for a song by title or album name. Furthermore, as shown in FIG. 1A, songs and/or albums attributed to different genres may be displayed on the screen in response to the PC user's selection.

Furthermore, a music player for playing the digital music downloaded via the Internet from the server is displayed in the main section of the screen. The music player, known as "MCY NETrax Player", may be downloaded to the PC also via the Internet from the server and contains operation controls for listening to the downloaded digital music.

The main section contains various content under several headings and sub-headings. For example, FIG. 1A shows

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albums and/or songs under the heading "Featured Selections" as selectively featured on the web site. Under the "MCY Choice Cuts" heading, a number of songs/albums is listed as, once again, selected by the web site vendor. FIG. 1A also shows the "News" category, representatively profiling an artist, and under the "Interview" heading an interview with an artist is available for viewing. It is understood, of course, that other music content and categories, headings, sub-headings, etc., may be provided on the web site, including hyperlinks to other web sites, pages, etc. It is noted that a vertical scroll bar may be required to view the content of the entire frame occupying the left portion of the screen.

The right portion of the display screen is independently controlled from the left portion and includes the "Shopping List" heading, as well as the login procedure for PC users. In particular, when a PC user desires to purchase a song or an album, she registers with the web site vendor using the on-line login procedure. The registration comprises entering the username and password to gain access to the web site vendor's products. When a new PC user logs in, she selects a username and password and then clicks on the "New User" software button on the screen. The new PC user is then requested to re-confirm the selected password by entering the password once more. If the password is properly re-confirmed, she is allowed to purchase CDs, download digital music, or make other purchases from the web site as described below. For repeat users, after clicking on the "Login" software button, the entered username and password are compared with those stored in the database connected to the server. If the match is found, the access to the purchase transactions on the web site is validated, and the PC user is permitted to shop for music and other goods. Otherwise, the error message is displayed, and the PC user is prohibited from buying the music or other products. In this case, however, the PC user may still use the left portion of the screen to browse through various titles, read the news, etc., as described above.

FIG. 1B shows an illustration of the video display screen after the PC user's login has been successfully completed. In this case, after browsing through the available songs and albums, let it be assumed that the PC user decides to purchase two albums. By clicking on her selection in the left portion of the screen, the desired items, either CD or downloadable digital music, appear in the right portion under the "MCY Shopping List" heading.

Namely, as the PC user browses through the web site, she can select items of interest for purchase. These items are displayed in a "shopping basket," that is, the right portion of the PC user's computer screen as shown in FIG. 1B. The shopping basket is displayed continuously if there is at least one item therein. Alternatively, the shopping basket can be displayed continuously even when empty. Among other things, the shopping basket can display the name and quantity of the items selected, as well as the cost. The shopping basket can also indicate the total cost of the items in the shopping basket, as shown in FIG. 1B.

In the preferred embodiment, the system permits the purchase of audio music files over the Internet. The PC user logs onto the vendor's web site and browses the songs available for purchase. The songs can be arranged by artist, music style, etc., as mentioned above. Further, the vendor can provide suggestions on the web site, directing the PC user to songs that might be desirable, based on that PC user's previous purchases, her indicated preferences, popularity of the songs, paid advertising and the like. If interested in a song, the PC user has the option of clicking on a song to "pre-listen" to it—hearing a 20-second clip, for example—

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as illustrated in FIG. 1C. If the PC user then wishes to purchase the song, she can submit her order by clicking on the icons located next to each song/album, as also shown in FIG. 1C. The order will be reflected in the shopping basket, always visible on the screen. As the PC user selects more items, each and every item is displayed in the shopping basket (to the extent that space permits—a scroll bar may be necessary should the PC user select a large number of items). At any point in time, the PC user can review her selections, deleting items she no longer desires. When the PC user has developed a satisfactory list, she can submit her order by clicking on the "Purchase Items" button, as illustrated in FIG. 1E showing the magnified right portion of the screen, including the shopping basket. The purchased items will be delivered immediately over the Internet to the user's computer if the selected music is in downloadable digital format. The user can then listen to the song at his computer or download it onto a portable player. Those items that are not available in digital format or as requested by the PC user, will be processed accordingly.

According to the present invention, the network-based system described above includes an e-commerce platform, suited particularly for the digital distribution of audio files (named NETrax), as well as regular mail order. The shopping basket provides a unique feature capable of handling heterogeneous products, such as the listing of audio files and any other digital files that after purchasing can be delivered digitally directly through the net, and traditional mail order products. According to one aspect of the present invention, all these products can be conveniently placed onto one shopping list even though they are not homogeneous. Conveniently, the customer can place digital orders (such as NETrax) and will get those delivered immediately via digital delivery over the internet to her PC; additionally, all other orders of finished product entered into the shopping list will be shipped to her home by mail, such as a private courier, for example.

In accordance with another aspect of the present invention, the shopping basket is always visible on the right side of the screen. The on-line consumer is thus able to constantly monitor the contents of her shopping list and the cost associated with her spending spree. By making the shopping basket visible on the screen all the time eliminates any hidden factors or charges, and it is always clear to the consumer what she intends to purchase.

By clicking on the product, visible on the "MCY Shopping List", the consumer can receive a detailed description of the product on the list before purchase. FIG. 1C representatively illustrates the details of the album entitled "Air Moon Safari" in the left portion of the screen, which is displayed in response to the pointer—the hand tool 16—activated by the user to select the desired item ("Air Moon Safari") in the shopping basket.

FIG. 1D is a block diagram of the network-based music distribution system according to the present invention. An on-line customer, such as the PC user 18 described above, logs onto a vendor's web site 20 via the Internet. The vendor's web site 20 is representatively shown in the figure as MCY MediaCity™. It is understood, of course, that the web site as shown in FIG. 1D is supported by a server having specific software and hardware configurations, such as Sun Microsystems mid-range computer with Windows operating system for executing applications programs written in Java, HTML or other programming language.

On the web site, the on-line customer may pre-listen to the desired music prior to the purchase. Following the pre-listen

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operation, the on-line customer may place an order for an immediate digital delivery of the selected music, book, etc., if available in digital format. Alternatively, she can order the selected information, such as text, moving or still images, graphics, etc., to be downloaded to her computer. Yet another option is to mail order CDs, video cassettes or disks, books, etc., for delivery to the designated place, such as home, place of work, friend's home. Still another option for the on-line consumer is to mail order a personally compiled CD containing selections from various artists, as specifically prepared by the web site vendor. Of course, those and additional buying options are presented to the on-line consumer via the graphical user interface (GUI) on the web site.

Continuing further with the description of FIG. 1D, regardless of the type of order or type of media selected by the on-line consumer, the desired items are placed in the shopping basket 22, as illustrated in detail in FIG. 1E. The on-line consumer may delete the items from the shopping basket or pre-listen to the tracks prior to the final purchase. After the list in the shopping basket 22 is finalized, the on-line consumer is requested to pay for the purchase. A charge may be made directly to the on-line consumer's credit card 24, or the payment may be tendered in other ways as customary in the trade. After confirming the receipt of payment, the product is delivered to the consumer. The delivery 26 is carried out by downloading the purchased digital music or text/graphics of the purchased information. Such operation requires the system's digital delivery software module to access a database for storing digital music, text, graphics, images, etc., requesting a copy of the purchased items, copying the purchased items from the database and transferring the copies of the purchased items to the consumer via the communications link established with the consumer's PC over the Internet.

If the purchased items are to be delivered by mail, then the system's mail delivery software module accesses a database for storing track/album titles available in CD format or titles of books, disks or other products available in the appropriate tangible medium. The titles of the purchased items are retrieved and transferred to a terminal controlled by a live operator. The operator may then contact a record/book warehouse, book/video shop for hard to find and special order items, or other contractual arrangements for outsourcing the order as customary in the industry. The operator subsequently supplies the customer's name and shipping address for fulfillment of the order, whereby the purchased items are shipped directly to the customer under the web site vendor's name.

FIG. 2A shows an illustration of the monitor screen 10 displaying another feature of the network-based system according to the present invention. The right portion of the screen lists tracks and/or albums previously purchased by the PC user. In particular, after authorizing the PC user's login as described above, the system's "history" software module accesses the database for storing record information for all previous sales activity. Those records pertaining to the PC user's purchases are selected by the module and transferred to the display software module for displaying on the screen. The records reflecting previous purchases are listed under the "Past Orders" sub-heading, as shown in detail in FIG. 2B.

The shopping history sub-system allows every customer who has ever previously shopped on the web site to access a list of all products that the consumer has purchased in the past. The access to the past purchases is provided after typing in a username and password. After entering this information, the PC user finds all products previously pur-



chased at the lower portion of the shopping list. All items obtained at the web site are displayed, and a vertical scroll bar may be required if the list is long. By clicking on one of these items, the main frame of the web site displays the product purchased. The customer can then go back and pre-listen to the songs (NETrax), as well as download the NETrax songs that were previously purchased.

In another aspect of the present invention, the inventive network-based system allows authors, composers, publishers and all related artists of a music product (collectively referred to as rights-holders) to have 24-hour, 7-day a week access to the worldwide sales of their product. FIG. 3A shows an illustration of the monitor screen 10 displaying the user interface for accessing the information on royalties.

A rights-holder accesses a web page for entering the proper identification information. As shown in the figure, login name and password are required for gaining access to the sales information. After entering the identifier, including the login name or username and password, the rights-holder is presented with a complete list of time, date and product name, amount, pricing and sales of the product distributed through the web site vendor. For example, royalty collection societies get access 24 hours/day, 7 days/week to the digital distribution platform where they can access the digitally distributed NETrax sales and then can collect money from the relevant parties.

The sales sub-system of the present invention maintains a record on a computer database (or the like) of all the purchases ever made by the user. Certain products and services will generate revenue for third party rights holders. For example, songwriters and royalty societies will obtain revenue based on the sales of records and songs. The sub-system permits the rights holders to access the web page of the computer system and determine what royalties they have generated. This royalty information can be maintained as a historical record (showing all the royalties earned to date) or as an incremental record (showing all the royalties currently outstanding), as illustrated in FIG. 3B.

The rights-holders for a particular song can access the web site and determine that a particular song was purchased, how many times the song was purchased, what the cost of the song was and what royalties are due to the rights holder. Of course, other information about the sale can be presented to the rights-holder, as desired by the designer of the particular system.

FIG. 3C is a block diagram of the sales sub-system for determining sales and royalties for the rights-holders in accordance with the present invention. After a customer buys a track or album via the web site as described above, the sales information is stored to a database 32 at MCY Music web site. A rights-holder may access the stored information via the Internet to check for royalties due.

After the login, the rights-holder may decide, for example, to check the sales for a particular album for the last 6 months. The sales tracking module accesses the sales information stored to the database after each customer's purchase transaction and then selects only the sales information pertaining to the desired album for the last 6 months. The selected information is then transferred to the display module for display.

In one aspect of the present invention, the rights-holder is restricted to the sales information stored in the database based on her connection to the commercial product. For example, composers, authors and publishers may be allowed to view one type of sales information, while performers, such as singers, musicians, etc., can view another types of

sales information. In addition, the system can calculate the dollar amount to be collected by the requesting rights-holder if a predetermined percentage from the sales is supplied by the rights-holder. For example, if a performer collects 5% from the sale of her album, then the system can calculate the total dollar amount owed to the performer during a specified period of time in accordance with the specified royalty rate.

As described above, once the PC user purchases a song or album in digital format, she can download the purchased music to her PC many times. In case her PC is damaged, the customer retains the right to the unlimited access after the purchase in case various eventualities occur, for example a crash of the hard drive or some other damage to the PC. In accordance with another aspect of the present invention, however, this unlimited access to the web site vendor's database does not allow the PC user to take advantage of this feature of the present invention for illegal purposes. For example, it appears as if the PC user may purchase a song, download it to her hard drive and then transfer the downloaded music to a portable storage medium or to another PC user via the Internet for playback.

To prevent the playback of the digital music that is illegally transferred from the purchaser, each song, album, or other property in digital format is assigned an identifier or key. This customer key is created for each user/customer corresponding to the username/password pair. Prior to the first download (namely, the first time that the customer desires to purchase a song through download), she logs in by entering username and password as described above. When the login is confirmed, the customer is supplied a key, which may be encrypted or unencrypted, over a secure network. The customer is not aware of this transfer from the server, and the actual key is never in the clear, never displayed to the customer.

The received key is then appended with additional data. This additional data uniquely identifies the customer's PC. For example, some information from the customer's hard drive or some other computer hardware/software component may be added to the key. Alternatively, some other component information, either as a prefix or suffix, may be combined with the received key. As a result, the new key uniquely identifies the customer and the customer's hardware. This key is then stored to the customer hard drive.

Prior to downloading a song, a key for the requesting customer is inserted into a header of the song. After the download, the key embedded in the header is used for comparing with the key on the customer's hard drive. Only if the two pieces of information provide an exact match, the song will be played at the customer's computer. Thus, if the customer decides to transfer a downloaded song to her friend, the song will not be played at her friend's computer because the new computer will not contain data that will match the key embedded in the song header.

The file stored to the customers hard drive may contain more than 1 key. For example, a key ring file may contain 3 keys, wherein each key is used by a different PC user.

FIG. 4A shows the name of the encoding format for digital music, whereby this format allows the header supplied to each digital file to contain the key for identifying the requester of information. Namely, as soon as the customer requests the NETrax song for downloading, the key corresponding to that customer is inserted into the header of the NETrax song for matching as described above.

FIG. 4B shows a portion of the screen displaying a music player 40 for listening to the downloaded music in the NETrax or MP3 format. The player 40 has "software"

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buttons for controlling the music playback that is similar to the conventional controls on the player. The player may play songs encoded in other formats, such as MP3 for example.

FIG. 4C shows a portion of the screen displaying the user interface for the web site for distributing digital or analog music as described above. Various search engines are available to the PC user to browse through the on-line selections and to purchase the desired music. FIG. 4D shows a screen display whereby the search is performed by an album. FIGS. 4E-4 show screen displays in response to the PC user search by different genres, such as electronic and dance, jazz, hip-hop, rap, R&B, country, rock and pop, world, children's and miscellaneous. FIG. 5 shows a screen displaying a page for various other portions of the web site, whereby additional information may be obtained by clicking on the displayed heading or sub-heading. A new web page will then be displayed for listing the requested information.

FIG. 6 shows a block diagram of the database structure in accordance with the present invention. A central server 60 is connected to a database which is a repository of sound files in digital format for downloading to the PC users. Another portion of the database contains user accounts, wherein each account holds user ID, password, key, and pointers to the purchased music in the database. Still another portion of the database contains a historical list of all items sold, either in digital format or CD. For each sold item, its title, price, artist name, etc., are maintained in the database, which is used for checking royalty information as described above.

FIG. 6 also shows regional servers 62 for accessing the central database. These local servers may contain information in their databases that is unique to a particular region of the world.

FIG. 7 is a block diagram of various software and hardware units (sub-systems), as well as database components, comprising the overall system of the present invention. It is understood that although several databases are listed in FIG. 7 in the preferred embodiment, the repository of data and information may be implemented as a single database. Similarly, two or more separate software sub-systems illustrated in FIG. 7 may be combined into one sub-system performing those functions as the individual sub-systems.

While the invention has been described and illustrated in connection with preferred embodiments, many variations and modifications as will be evident to those skilled in this art may be made without departing from the spirit and scope of the invention, and the invention is thus not to be limited to the precise details of methodology or construction set forth above as such variations and modification are intended to be included within the scope of the invention.

What is claimed is:

1. A system for digitally distributing music comprised of tracks and albums over the Internet to a plurality of the Internet users, comprising:

means for assigning a key to a track for downloading to a user;

means for inserting the assigned key into said track prior to the downloading;

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means for transferring the same assigned key to said user prior to downloading said track;

means for combining the transferred key with additional data to generate an identifier that uniquely identifies a customer's computer; and

means for verifying that said key extracted from said track matches information that is based on the generated identifier to enable the playback of said track.

2. The system according to claim 1, wherein the assigning means assigns said key that is unique to said user in correspondence to a username and password combination.

3. The system according to claim 2, wherein said user enters said username and password combination to access said track in a database prior to the assignment of said key.

4. The system according to claim 3, wherein said track is downloaded only if said user purchases said track prior to the downloading.

5. The system according to claim 4, further comprising means for storing said identifier in said user's computer for subsequent verification of the authorized downloading of tracks.

6. The system according to claim 5, wherein said additional data uniquely identifies a hardware/software component of said user's computer.

7. The system according to claim 6, wherein the inserting means inserts the assigned key into a header of said track.

8. A method for digitally distributing music comprised of tracks and albums over the Internet to a plurality of the Internet users, comprising:

assigning a key to a track for downloading to a user; inserting the assigned key into said track prior to the downloading;

transferring the same assigned key to said user prior to downloading said track;

combining the transferred key with additional data to generate an identifier that uniquely identifies a customer's computer; and

verifying that said key extracted from the downloaded track matches information that is based on the generated identifier to enable the playback of said track.

9. The method according to claim 8, wherein the assigned key is unique to said user in correspondence to a username and password combination.

10. The method according to claim 9, wherein said user enters said username and password combination to access said track in a database prior to the assignment of said key.

11. The method according to claim 10, wherein said track is downloaded only if said user purchases said track prior to the downloading.

12. The method according to claim 11, further comprising storing said identifier in said user's computer for subsequent verification of the authorized downloading of tracks.

13. The method according to claim 12, wherein said additional data uniquely identifies a hard drive of said user's computer.

14. The method according to claim 13, wherein the assigned key is inserted into a header of said track.

\* \* \* \* \*

	L #	Hits	Search Text	DBs
1	L1	309481	purchas\$3 or buy\$3 or sell\$3 or sale or trad\$3	USPAT
2	L2	1654	broker\$4 and 1	USPAT
3	L3	666	2 and payment	USPAT
4	L4	527049 8	availab\$5 or (order\$3 near3 fill\$3) or match\$3	USPAT
5	L5	646	3 and 4	USPAT
6	L6	549	5 and list\$3	USPAT
7	L7	11446	list near5 (product or property or item)	USPAT
8	L8	132	5 and 7	USPAT
9	L9	0	8 and address	USPAT
10	L10	117	8 and address	USPAT
11	L11	75	10 and shopping	USPAT
12	L12	1	6058417.pn.	USPAT
13	L13	41639	(intellectual adj property) or song or music or (download near3 software)	USPAT
14	L14	1728	1 same 13	USPAT
15	L15	531843 4	availab\$5 or (order\$3 near3 fill\$3) or match\$3 or search\$3	USPAT
16	L16	1294	14 and 15	USPAT
17	L17	60	16 and broker\$4	USPAT
18	L18	39	17 and payment	USPAT

Considered

Considered

# **MCheung\_Job\_1\_of\_1**

**Printed by HPS Server  
for**

**EAST**

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**Printer: cpk5\_7v01\_gbgzptr**

**Date: 08/18/03**

**Time: 13:49:25**

## **Document Listing**

<b>Document</b>	<b>Selected Pages</b>	<b>Page Range</b>	<b>Copies</b>
<b>WO003038560</b>	<b>63</b>	<b>1 - 63</b>	<b>1</b>
<b>Total (1)</b>	<b>63</b>	<b>-</b>	<b>-</b>



	L #	Hits	Search Text	DBs
1	L1	1612	(purchas\$3 or buy\$3 or shopping or sell\$3 or sale) near5 (online or internet or website)	USPAT
2	L2	66366	(availab\$5 near5 (product or item)) or (out near3 stock)	USPAT
3	L3	511	1 and 2	USPAT
4	L4	330	3 and payment	USPAT
5	L5	16115	list\$3 near5 (product or item)	USPAT
6	L6	213	4 and 5	USPAT
7	L7	16476	list\$3 near5 (product or item or sale)	USPAT
8	L8	217	7 and 4	USPAT
9	L9	164	8 and match\$3	USPAT
10	L10	158	9 and (search\$3 or brows\$3)	USPAT

Considered



US006058417A

**United States Patent** [19]

Hess et al.

[11] **Patent Number:** **6,058,417**[45] **Date of Patent:** **May 2, 2000**

[54] **INFORMATION PRESENTATION AND MANAGEMENT IN AN ONLINE TRADING ENVIRONMENT**

[75] Inventors: **Martin L. Hess**, Aptos; **Michael K. Wilson**, Los Gatos, both of Calif.

[73] Assignee: **eBay Inc.**, San Jose, Calif.

[21] Appl. No.: **09/177,726**

[22] Filed: **Oct. 23, 1998**

[51] Int. Cl.<sup>7</sup> ..... **G06F 13/00**

[52] U.S. Cl. .... **709/219; 709/203; 705/27**

[58] Field of Search ..... **709/217, 218, 709/219, 203, 300, 302; 707/9, 10, 100, 101, 104, 501; 345/329, 335, 339, 349; 705/26, 27, 28, 29**

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*Primary Examiner*—Zarni Maung

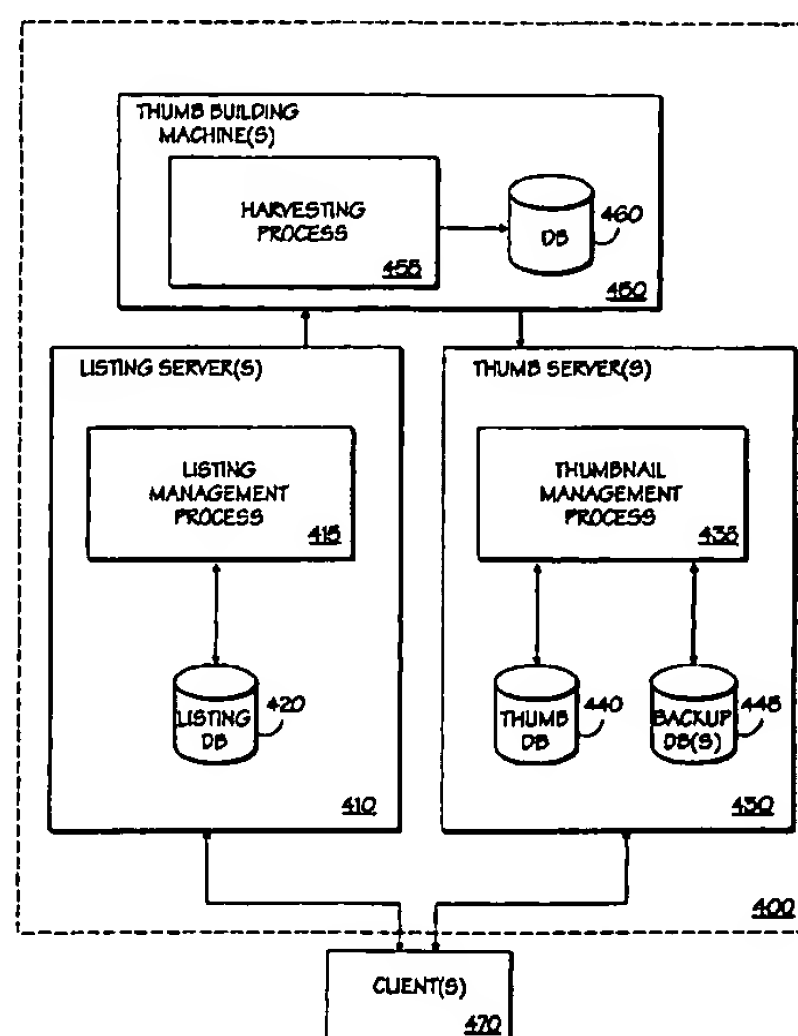
*Assistant Examiner*—Viet Vu

*Attorney, Agent, or Firm*—Blakely, Sokoloff, Taylor & Zafman, LLP

[57] **ABSTRACT**

A method and apparatus for information presentation and management in an online trading environment are provided. According to one aspect of the present invention, person-to-person commerce over the Internet is facilitated by providing prospective buyers the ability to quickly preview items for sale. Images are harvested from a plurality of sites based upon user-supplied information. The user-supplied information includes descriptions of items for sale and locations from which images that are to be associated with the items can be retrieved. Thumbnail images are created corresponding to the harvested images and are aggregated onto a web page for presentation at a remote site. According to another aspect of the present invention, a user may submit a query to preview items for sale. After receiving the query, thumbnail images corresponding to items that satisfy the user query are displayed, each of the thumbnail images previously having been created based upon a user-specified image.

**3 Claims, 12 Drawing Sheets**



100 ↗

eBay

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Top : Antiques : Folk Art

Current Auctions

Current || New Today || Ending Today || Completed || Going, Gone

<b>NEW!</b>	<u>Vintage handmade paper florals on wood tray</u> <b>PIC</b>	\$2.00	-	10/26 10:23
<b>NEW!</b>	<u>**SUPER TRAMP ART 3 STORY BUILDING BOX**</u> <b>PIC</b>	\$100.00	-	10/26 09:44
<b>NEW!</b>	<u>Mexican Pottery Vase No. 1</u> <b>PIC</b>	\$5.00	-	10/26 09:26
<b>NEW!</b>	<u>Mexican Pottery Vase No. 2</u> <b>PIC</b>	\$5.00	-	10/26 09:09
<b>NEW!</b>	<u>Antique look Xmas Wall Decor "Mittins"</u> <b>PIC</b>	\$3.00	-	10/26 09:08
<b>NEW!</b>	<u>Mexican Pottery Vase No. 3</u> <b>PIC</b>	\$5.00	-	10/26 08:57
<b>NEW!</b>	<u>Mexican Pottery Vase No. 4</u> <b>PIC</b>	\$5.00	-	10/26 08:45
<b>NEW!</b>	<u>Hand painted Pottery Wine Jug with Cup</u> <b>PIC</b>	\$40.00	-	10/26 08:24
<b>NEW!</b>	<u>(SUPER!) Folk Art Tucan Head Cane</u> <b>PIC</b>	\$49.00	-	10/26 08:12
<b>NEW!</b>	<u>SCRIMSHAW</u> <b>PIC</b>	\$60.00	-	10/26 08:09
<b>NEW!</b>	<u>Folk Art Hand Carved Light House - Large</u> <b>PIC</b>	\$25.00	-	10/22 08:41
<b>NEW!</b>	<u>Antique Hand Made Adirondak 31" Plant Stand</u> <b>PIC</b>	\$9.99	-	10/26 07:40
<b>NEW!</b>	<u>BUFFALO, MINNESOTA FISH DECOY-red&amp;white</u> <b>PIC</b>	\$15.00	-	10/26 07:36
<b>NEW!</b>	<u>BLACK FOLK ART DOLL- "SHUFFLIN SAM"</u> <b>PIC</b>	\$22.00	-	10/26 06:52
<b>NEW!</b>	<u>HOLY FRUJOLE! TRIPLE KITCHEN VIRGIN APPEARS</u> <b>PIC</b>	\$29.00	1	10/26 06:39

105

170 ↗

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Fig. 1  
(Prior Art)

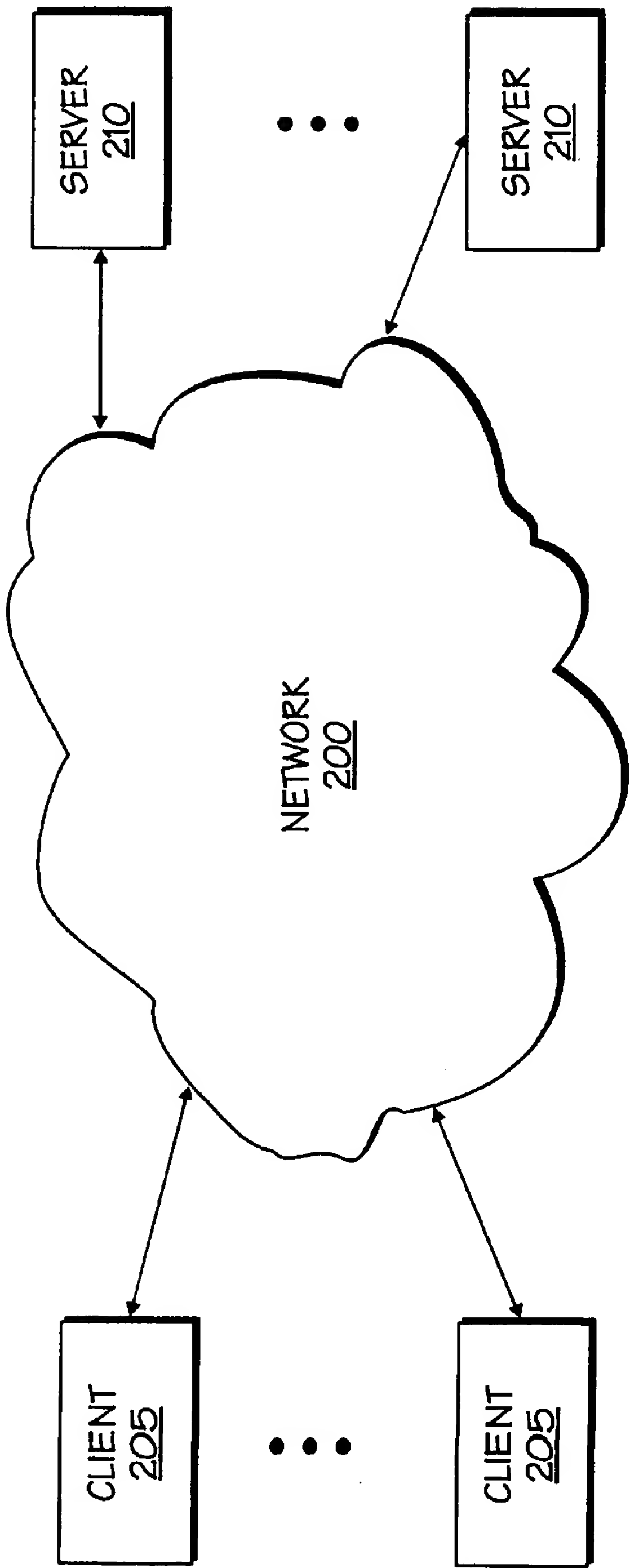


Fig. 2

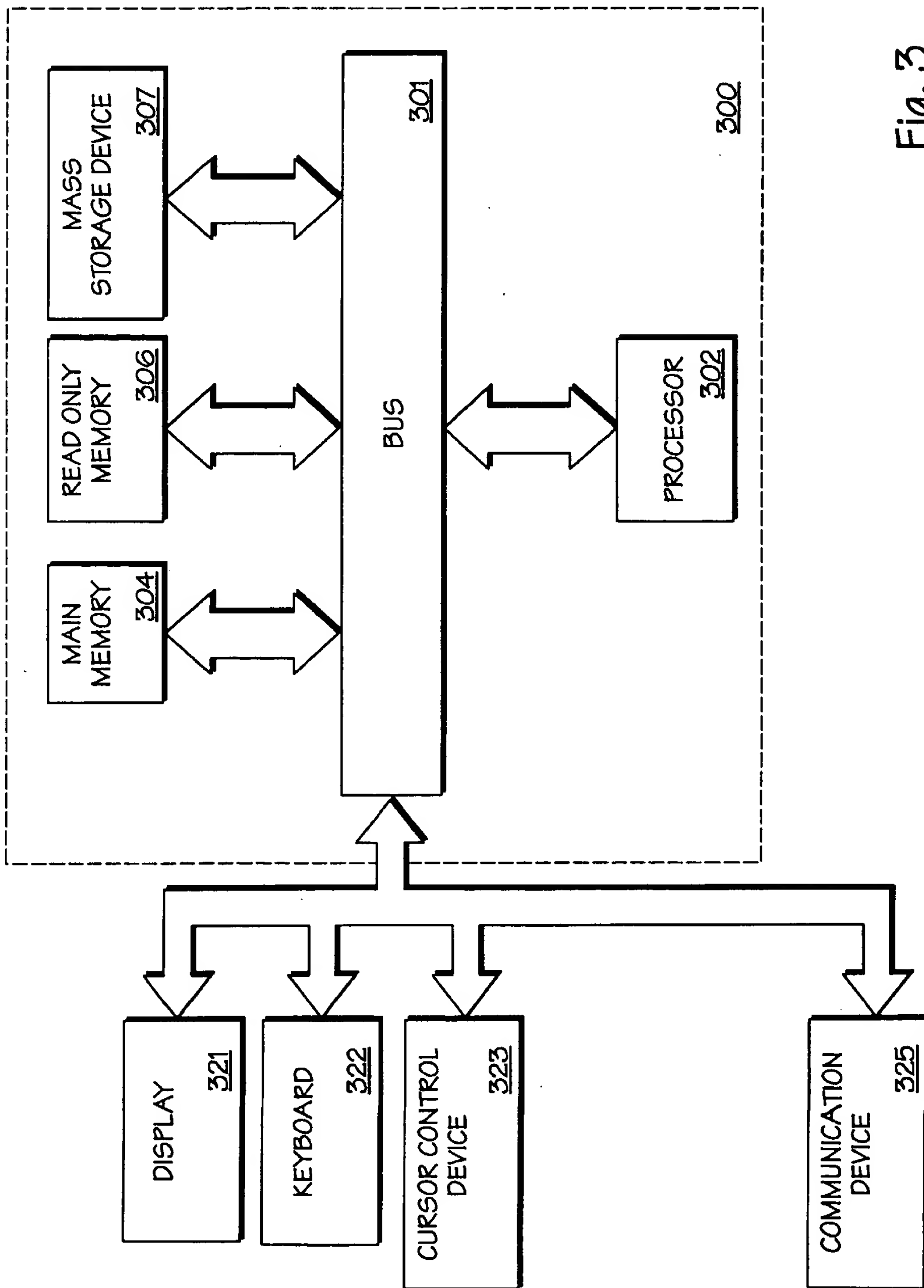


Fig. 3

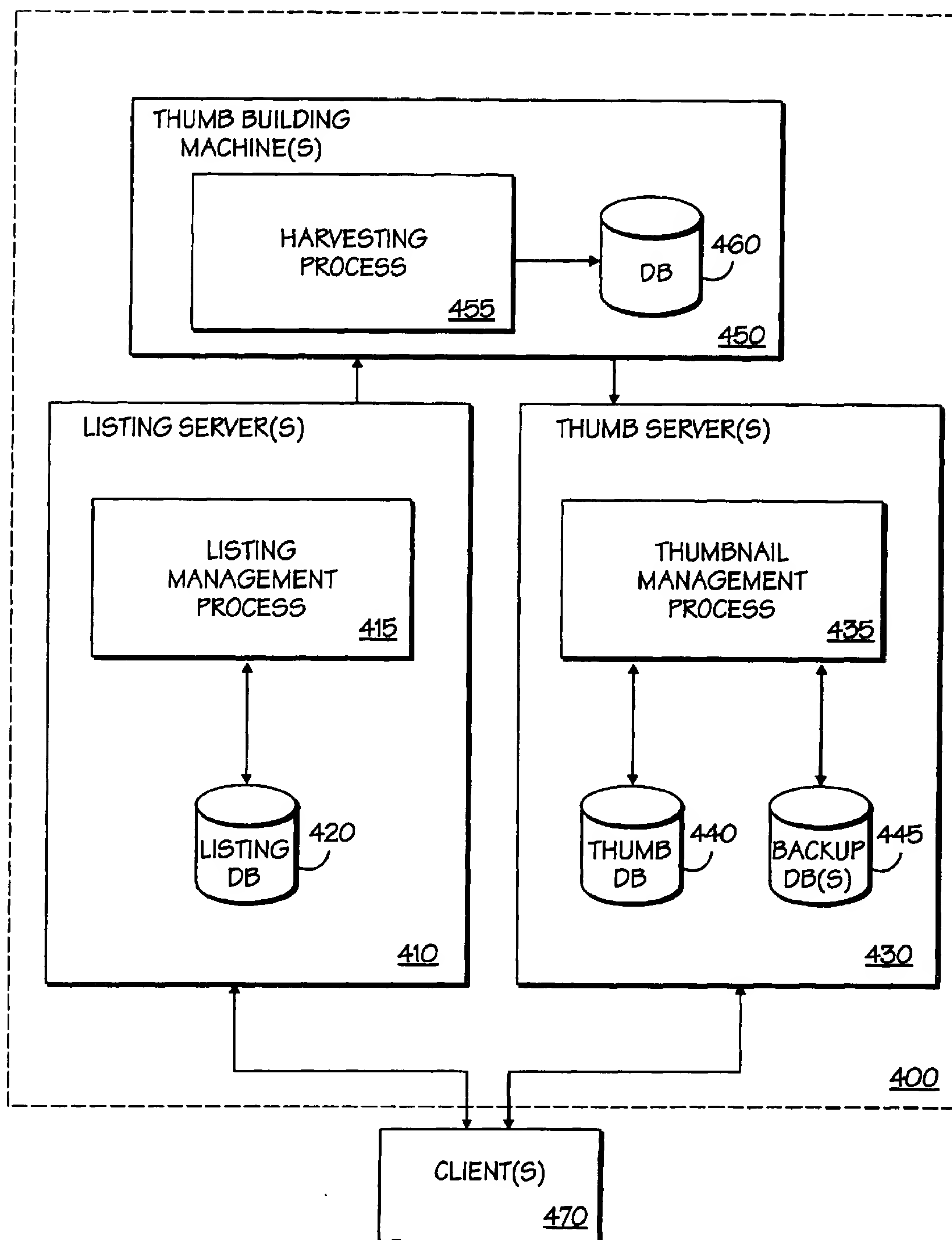


Fig. 4

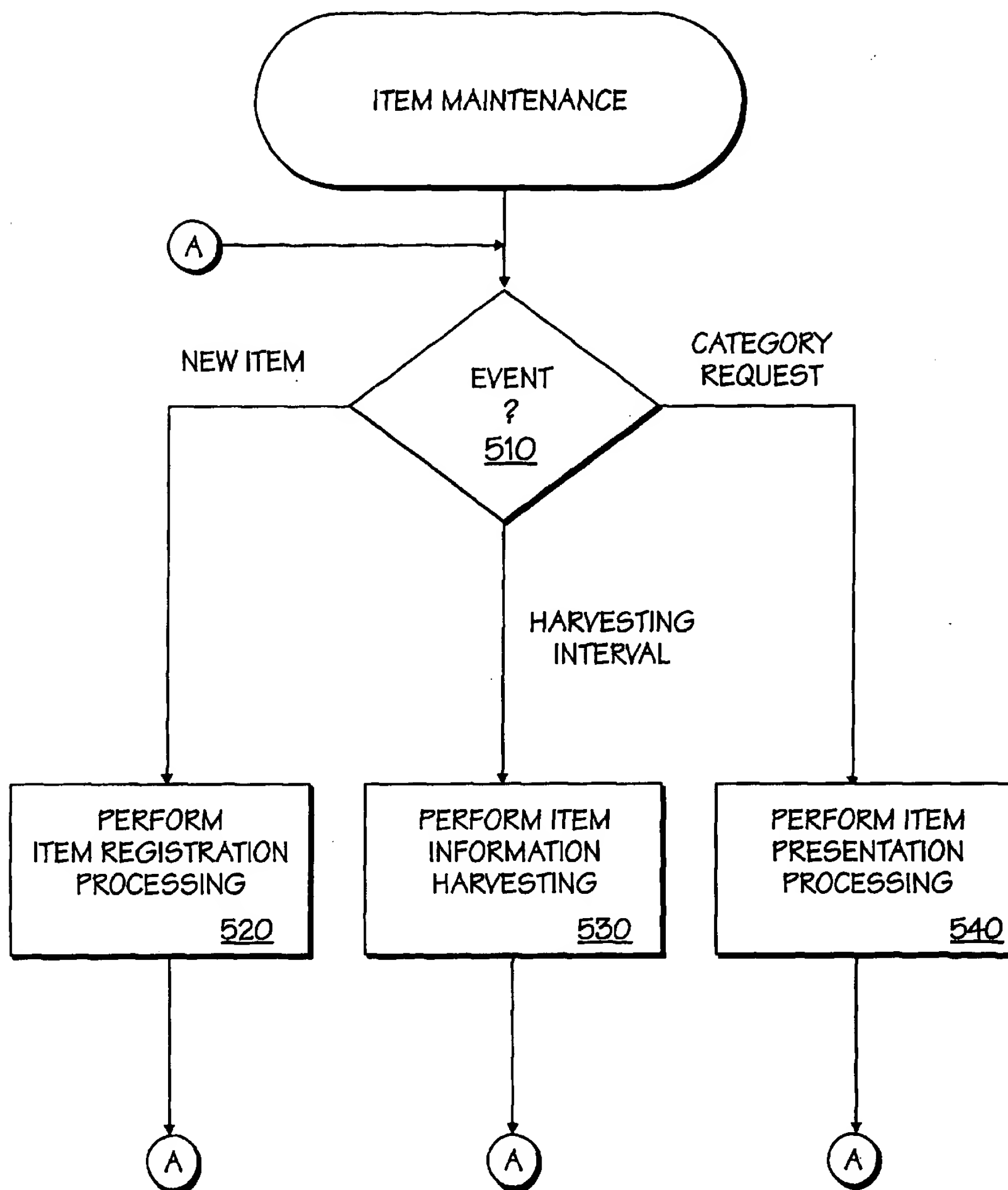
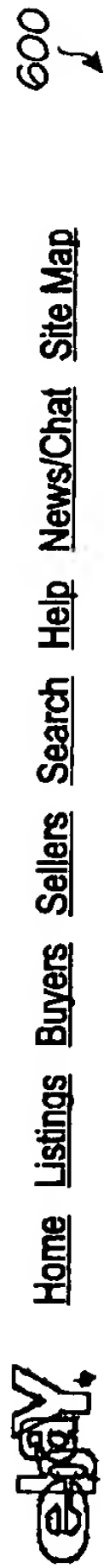


Fig. 5



So many services, so little time! Never fear, the eBay Helpful Services page is [here](#).  
Click [here](#) for our Halloween Bash!

[Sell Your Item](#)

User ID / Password	User ID or E-mail address <input type="text"/> Password (forgotten it?) <input type="text"/>
Title (no HTML)	<input type="text"/> e.g.: Rare collection of 100 beanie babies (required)
Item location	<input type="text"/> e.g.: San Jose, California (required) Please specify the geographic location of the item(s) you are offering. This gives the potential bidder an idea of shipping costs, etc.

625

Category (choose one category only) Try to choose the most specific category, especially for computer-related items	(required)
Antiques: <input type="text"/>	Books, Movies, Music: <input type="text"/>

630

Accepted Payment Methods (choose as many as apply)	<input type="checkbox"/> Money Order/Cashiers Check <input type="checkbox"/> Personal Check <input type="checkbox"/> Visa/MasterCard <input type="checkbox"/> COD (collect on delivery) <input type="checkbox"/> On-line Escrow <input type="checkbox"/> American Express <input checked="" type="checkbox"/> See Item Description <input type="checkbox"/> Other <input type="checkbox"/> Discover
Shipping Terms	<input type="checkbox"/> Seller Pays <input type="checkbox"/> Buyer Pays Fixed Amount <input type="checkbox"/> Buyer Pays Actual Shipping Costs <input type="checkbox"/> Will Ship Internationally <input checked="" type="checkbox"/> See Item Description

640

Fig. 6A



600

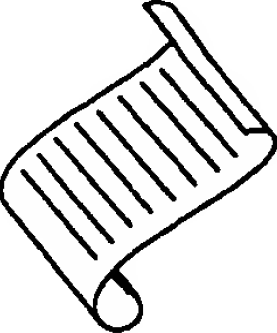
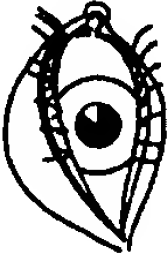
Description (HTML ok) 	<div>645</div> <div>(required)</div>
Picture URL 	<div>http://</div> <div>(optional) 650</div> <div>If you have a URL to a picture you would like to include in, but did not enter HTML code for it in the description above, you may enter the URL here. By entering it here, the <b>PIC</b> icon will appear next to your item in the listings. Note that you must enter a complete URL to a picture on your own Web site. If you'd like more information on including pictures with your listings, three excellent tutorials on the subject can be found at <a href="http://www.pongo.com/tutorials/aweb-images/">http://www.pongo.com/tutorials/aweb-images/</a>, <a href="http://www.pixhost.com/">http://www.pixhost.com/</a>, and <a href="http://www.twaze.com/aolpix/">http://www.twaze.com/aolpix/</a>. (These tutorials are maintained by eBay Community members, and eBay is not responsible for their content or accuracy).</div>
Quantity 655	<div>1</div> <div>(type numerals only) (optional)</div>
Minimum bid 660	<div></div> <div>per item (numerals and decimal point "." only) (required)</div>
Duration	<div>7</div> <div>days (required)</div> <div>665</div>

Fig. 6B

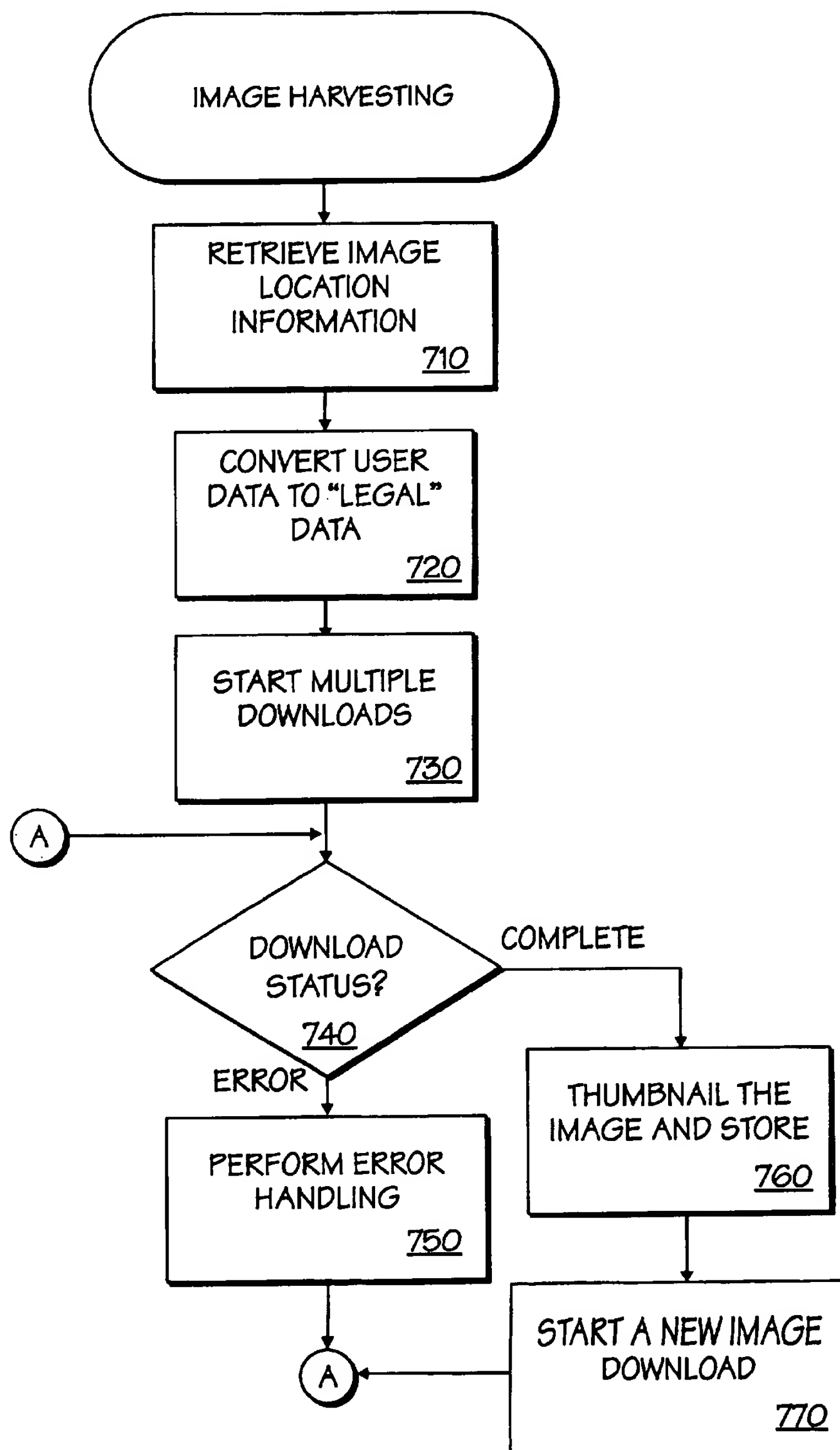


Fig. 7

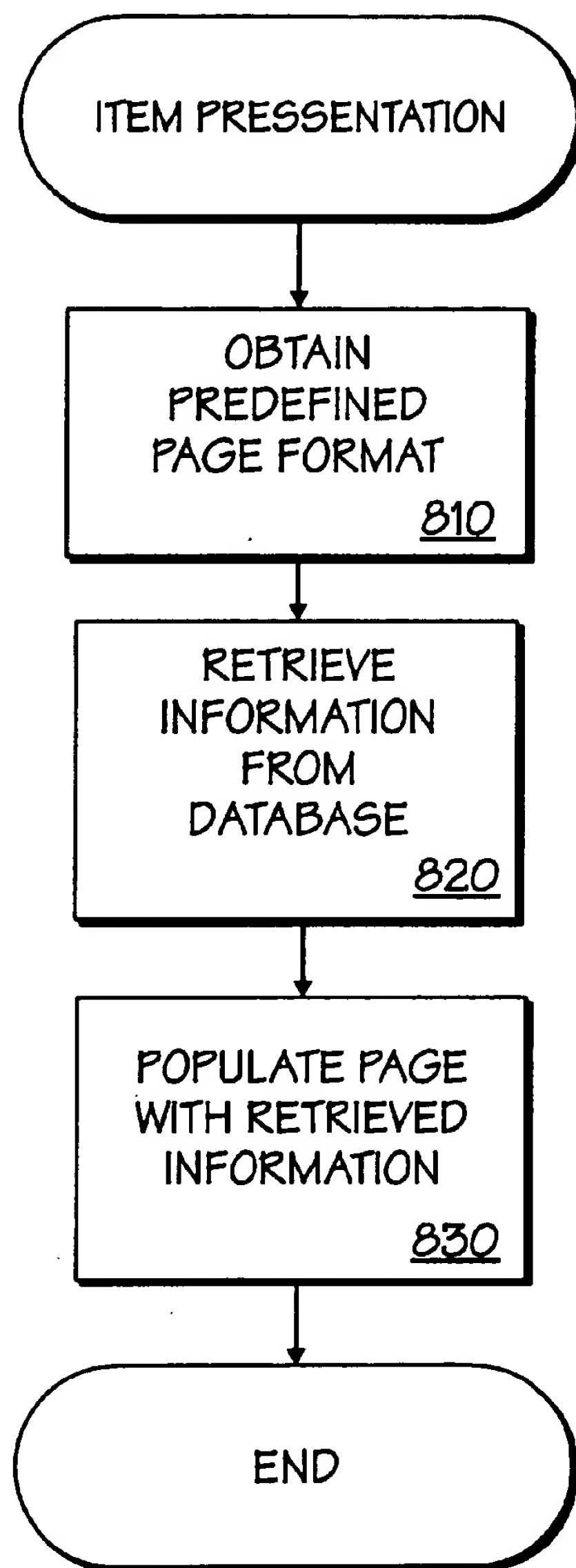


Fig. 8

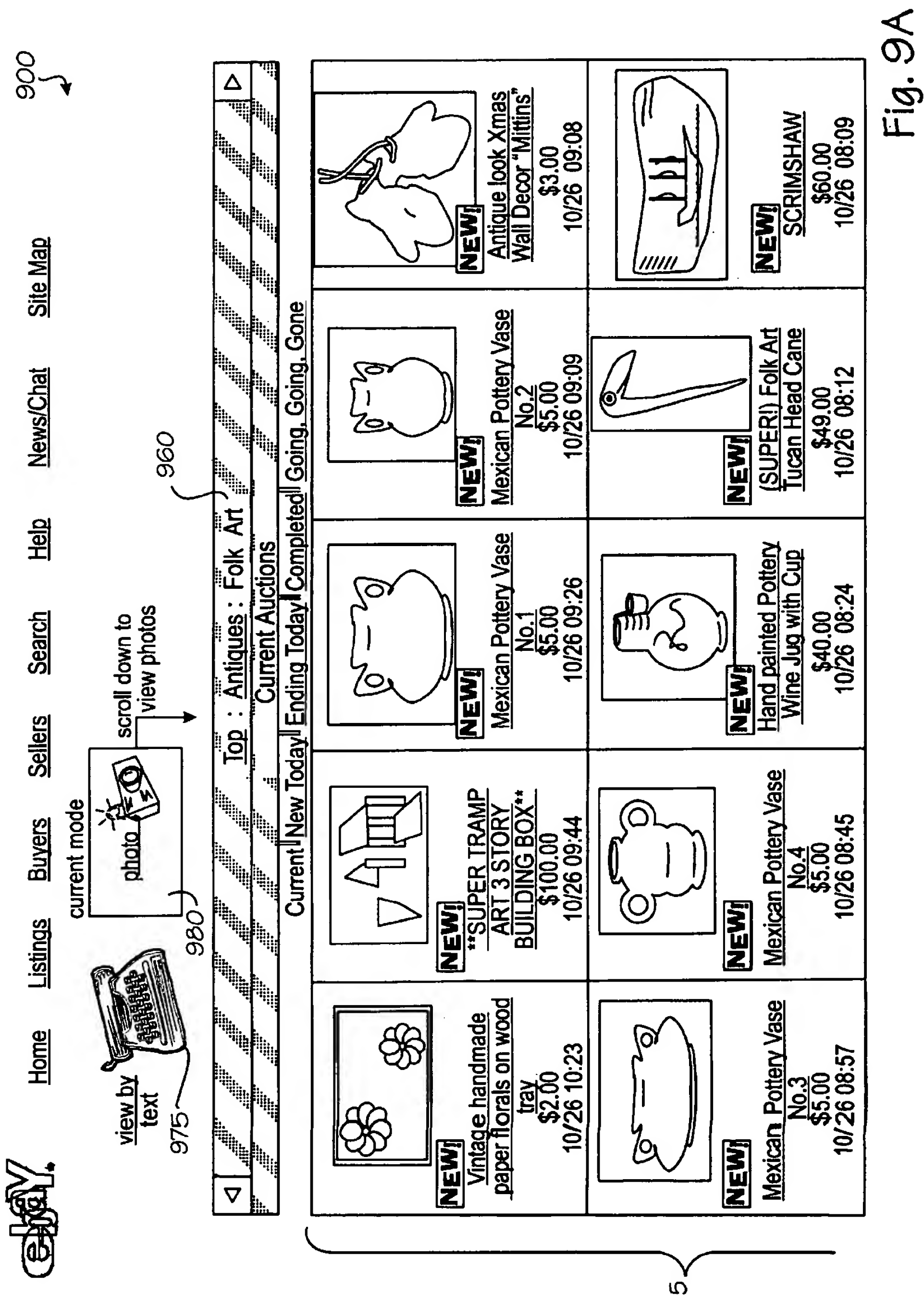


Fig. 9A

900

<div>5</div> <div>920</div> <div>921</div> <div><b>NEW!</b> Folk Art Hand Carved Light House - Large</div> <div>\$25.00 10/22 08:41</div>	<div><b>NEW!</b> Antique Hand Made Adirondak 31" Plant Stand</div> <div>\$9.99 10/26 07:40</div>	<div><b>NEW!</b> BUFFALO, MINNESOTA FISH DECOY-red&amp;white</div> <div>\$15.00 10/26 07:36</div>	<div><b>NEW!</b> BLACK FOLK ART DOLL- "SHUFFLIN SAM"</div> <div>\$22.00 10/26 06:52</div>	<div><b>NEW!</b> HOLY FRIJOLE! TRIPLE KITCHEN VIRGIN APPEARS</div> <div>\$29.99(1) 10/26 06:39</div>
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Top : [Antiques](#) : Folk Art



Fig. 9B



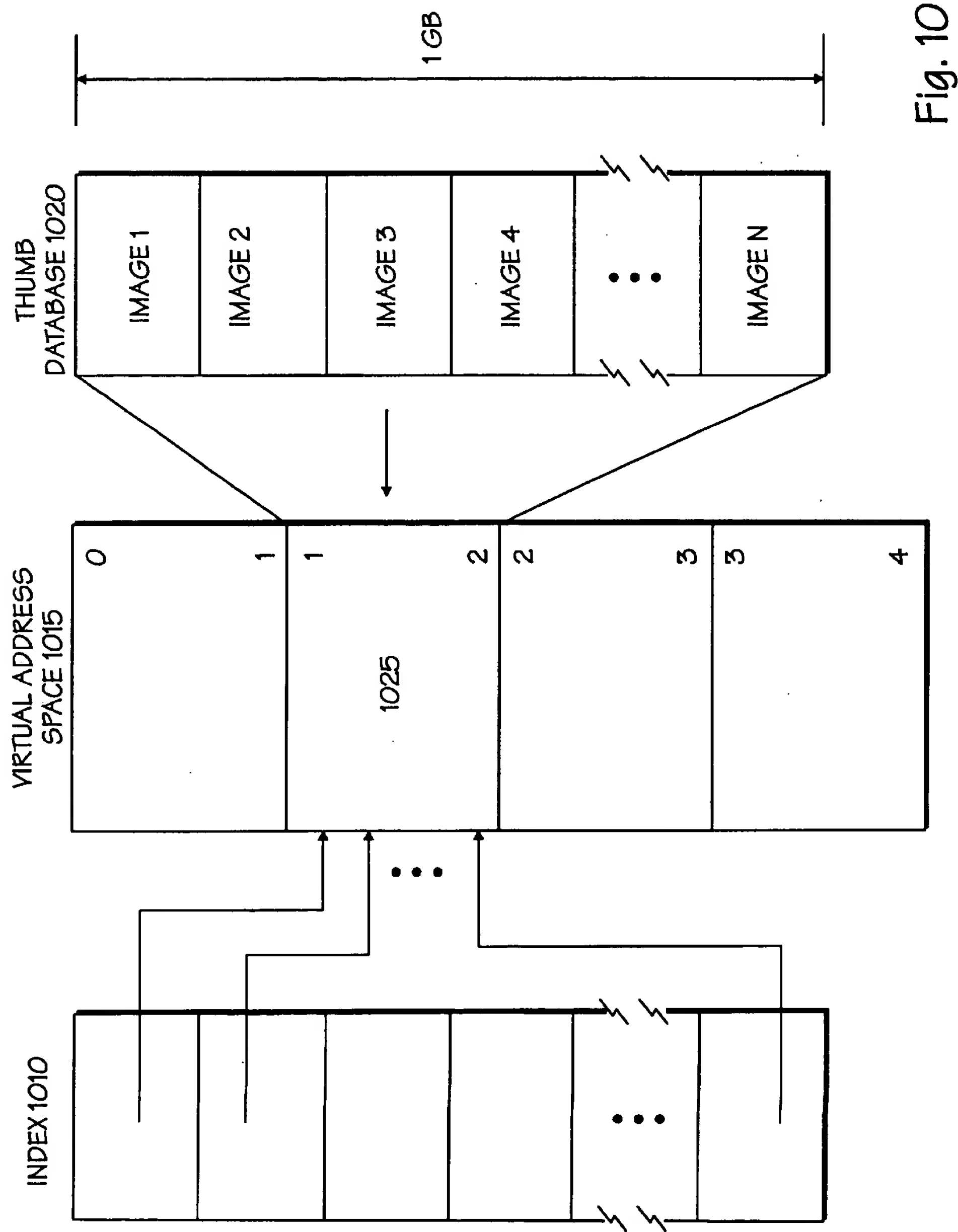


Fig. 10

# INFORMATION PRESENTATION AND MANAGEMENT IN AN ONLINE TRADING ENVIRONMENT

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## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The invention relates generally to the field of online commerce. More particularly, the invention relates to information presentation and management in an online trading environment, such as an online shopping site, an online auctioning site, an online e-commerce site, an online person-to-person trading site, or the like.

### 2. Description of the Related Art

More and more Internet users are realizing the ease and convenience of buying and selling online by way of person-to-person online trading pioneered by eBay Inc., the assignee of the present invention. As a result, collectors, hobbyists, small dealers, unique item seekers, bargain hunters, and other consumers, are able to buy and sell millions of items at various online shopping sites.

The success of an online shopping site depends upon its ability to provide an enjoyable shopping experience and an easy-to-use environment in which buyers and sellers can conduct business efficiently. Current online shopping sites have certain limitations in the manner in which they present information to users. With reference to FIG. 1, a typical item listing will briefly be described. A textual list of items 105 representing the results of a user query is presented within a web page format 100 to the user (e.g., a prospective buyer) on his/her computer system. In this example, the web page format 100 presented to the prospective buyer includes items 110 that are currently available for sale on a particular page 170 within a particular category 160. Each item 110 includes a hypertext link 115 having a title (or brief description) of the item for sale, an indication 120 of whether or not an image of the item is available, the current minimum bid 130, the number of bids received 140, and an auction ending time 150. Based upon the item titles, prospective buyers can decide whether or not to view more detailed information on a particular item. In order to view detailed information on a particular item of interest, the buyer is required to select the hypertext link 115 associated with the item. A new page is then presented with more detailed information regarding the item selected. The more detailed information may include, among other things, the item's starting price, a username associated with the seller of the item, a username associated with the current high bidder, a detailed description of the item in text or HTML format, and an image the seller has associated with the item, for example. To continue browsing other items of interest, the prospective buyer must return to the previously viewed listing, using the browser's "Back" function, for instance, and select the hypertext link 115 associated with the next item of interest. While associating an image with an item, such as a digitized picture of the item, has the advantage of allowing the prospective purchaser to make a more informed decision, the iterative process of individually selecting items to view their images can be very time consuming and even frustrating.

In the light of the foregoing, it is desirable to provide an improved user interface for online commerce sites. In particular, it would be advantageous to enhance the online trading experience by providing buyers with a mechanism to more quickly preview items for sale. Additionally, the trading experience of sellers may be improved by automating certain aspects associated with item registration.

## BRIEF SUMMARY OF THE INVENTION

A method and apparatus for information presentation and management in an online trading environment are described. According to one aspect of the present invention, person-to-person commerce over the Internet is facilitated by providing prospective buyers the ability to quickly preview items for sale. Images are harvested from a plurality of sites based upon user-supplied information. The user-supplied information includes descriptions of items for sale and locations from which images that are to be associated with the items can be retrieved. Thumbnail images are created corresponding to the harvested images and are aggregated onto a web page for presentation at a remote site.

According to another aspect of the present invention, a user may submit a query to preview items for sale. After receiving the query, thumbnail images corresponding to items that satisfy the user query are displayed, each of the thumbnail images previously having been created based upon a user-specified image.

Other features of the present invention will be apparent from the accompanying drawings and from the detailed description which follows.

## BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

The present invention is illustrated by way of example, and not by way of limitation, in the figures of the accompanying drawings and in which like reference numerals refer to similar elements and in which:

FIG. 1 is an example of a prior interface to an online person-to-person trading site that employs text-based item listings.

FIG. 2 is a simplified view of an exemplary client-server environment in which online commerce may take place.

FIG. 3 is an example of a computer system upon which one embodiment of the present invention may be implemented.

FIG. 4 is a high level illustration of the interaction among various devices according to one embodiment of the present invention.

FIG. 5 conceptually illustrates high level item maintenance processing according to one embodiment of the present invention.

FIG. 6 is an exemplary form that may be used during item registration.

FIG. 7 is a flow diagram illustrating image harvesting processing according to one embodiment of the present invention.

FIG. 8 is a flow diagram illustrating item presentation processing according to one embodiment of the present invention.

FIG. 9 is an example of an item presentation format for an online person-to-person trading site according to one embodiment of the present invention.

FIG. 10 illustrates memory mapped file access to the thumb database according to one embodiment of the present invention.

### DETAILED DESCRIPTION OF THE INVENTION

A method and apparatus for information presentation and management in an online trading environment are described. In the following description, for the purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be apparent, however, to one skilled in the art that the present invention may be practiced without some of these specific details. In other instances, well-known structures and devices are shown in block diagram form.

As will be described in greater detail below, the present invention includes features for enhancing the online trading experience for both buyers and sellers. When sellers register an item for sale, they provide information about the item. For example, the seller may associate a textual description, an image, shipping terms, and other information with the item. Advantageously, according to one aspect of the present invention, to associate an image with an item for sale, the seller is not required to provide the image in a particular format or size; rather, the method and apparatus of the present invention automatically harvest images and transform them to an appropriate format for use with the system. According to another aspect of the present invention, prospective purchasers visiting an online commerce site employing the present invention need not navigate to a separate web page for each item to view images associated with the items; rather, thumbnail images for multiple items are aggregated onto a web page to allow quick preview by the prospective purchaser. In the context of this application, the term "thumbnail" or "thumbnail image" generally refers to a new image that is a miniature version of the original, user-supplied image. Typically, the thumbnail image will be approximately 1 inch×1 inch or smaller. According to one embodiment, thumbnail images are approximately 96 pixels×96 pixels.

In the preferred embodiment, the steps of the present invention are embodied in machine-executable instructions. The instructions can be used to cause a general-purpose or special-purpose processor which is programmed with the instructions to perform the steps of the present invention. Alternatively, the steps of the present invention might be performed by specific hardware components that contain hardwired logic for performing the steps, or by any combination of programmed computer components and custom hardware components.

The present invention may be provided as a computer program product which may include a machine-readable medium having stored thereon instructions which may be used to program a computer (or other electronic devices) to perform a process according to the present invention. The machine-readable medium may include, but is not limited to, floppy diskettes, optical disks, CD-ROMs, and magneto-optical disks, ROMs, RAMs, EPROMs, EEPROMs, magnet or optical cards, or other type of media/machine-readable medium suitable for storing electronic instructions. Moreover, the present invention may also be downloaded as a computer program product, wherein the program may be transferred from a remote computer (e.g., a server) to a requesting computer (e.g., a client) by way of data signals embodied in a carrier wave or other propagation medium via a communication link (e.g., a modem or network connection).

Importantly, while embodiments of the present invention will be described with respect to an online person-to-person trading environment, the method and apparatus described

herein are equally relevant to other applications in which image data is collected from disparate sources and presented to a user and/or other e-commerce environments, such as online shopping sites, auctioning sites, and the like.

#### Client-Server Environment

FIG. 2 is a simplified view of an exemplary client-server environment, such as the World Wide Web (the Web), in which online commerce may take place. The architecture of the Web follows a conventional client-server model. The terms "client" and "server" are used to refer to a computer's general role as a requester of data (the client) or provider of data (the server). Web clients 205 and Web servers 210 communicate using a protocol such as HyperText Transfer Protocol (HTTP). In the Web environment, Web browsers reside on clients and render Web documents (pages) served by the Web servers. The client-server model is used to communicate information between clients 205 and servers 210. Web servers 210 are coupled to the Internet 200 and respond to document requests and/or other queries from Web clients 205. When a user selects a document by submitting its Uniform Resource Locator (URL), a Web browser, such as Netscape Navigator or Internet Explorer, opens a connection to a server 210 and initiates a request (e.g., an HTTP get) for the document. The server 210 delivers the requested document, typically in the form of a text document coded in a standard markup language such as HyperText Markup Language (HTML).

#### Exemplary Computer System

A computer system 300 representing an exemplary server in which features of the present invention may be implemented will now be described with reference to FIG. 3. Computer system 300 comprises a bus or other communication means 301 for communicating information, and a processing means such as processor 302 coupled with bus 301 for processing information. Computer system 300 further comprises a random access memory (RAM) or other dynamic storage device 304 (referred to as main memory), coupled to bus 301 for storing information and instructions to be executed by processor 302. Main memory 304 also may be used for storing temporary variables or other intermediate information during execution of instructions by processor 302. Computer system 300 also comprises a read only memory (ROM) and/or other static storage device 306 coupled to bus 301 for storing static information and instructions for processor 302.

A data storage device 307 such as a magnetic disk or optical disc and its corresponding drive may also be coupled to computer system 300 for storing information and instructions. Computer system 300 can also be coupled via bus 301 to a display device 321, such as a cathode ray tube (CRT) or Liquid Crystal Display (LCD), for displaying information to a computer user. Typically, an alphanumeric input device 322, including alphanumeric and other keys, may be coupled to bus 301 for communicating information and/or command selections to processor 302. Another type of user input device is cursor control 323, such as a mouse, a trackball, or cursor direction keys for communicating direction information and command selections to processor 302 and for controlling cursor movement on display 321.

A communication device 325 is also coupled to bus 301 for accessing remote servers via the Internet, for example. The communication device 325 may include a modem, a network interface card, or other commercially available network interface devices, such as those used for coupling to an Ethernet, token ring, or other type of network. In any event, in this manner, the computer system 300 may be coupled to a number of clients and/or other servers via a



conventional network infrastructure, such as a company's Intranet and/or the Internet, for example.

#### System Overview

FIG. 4 is a high level illustration of the interaction among various devices according to one embodiment of the present invention. According to the embodiment depicted, an online commerce site 400 may comprise a listing server 410, a thumb server 430, and a thumb building machine 450. Briefly, the listing server 410 includes a listing management process 415 and a listing database 420. The listing management process interacts with sellers to allow new items to be added to the listing database 420 and with prospective purchasers to provide them with information about items in which they are interested. As will be described further below, the listing management process 415 supports both a text-based item listing format, such as that illustrated in FIG. 1, or a Gallery™ presentation format, such as that illustrated in FIG. 9, that includes thumbnail images of the items for sale (Gallery is a trademark of eBay Inc. of San Jose, Calif.). According to one embodiment, depending on a user-selected mode, e.g., text mode or photo mode, the listing management process 415 provides HTML appropriate for the text-based item listing format or the Gallery presentation format, respectively.

The thumb building machine 450 includes a harvesting process 455 and a database 460. As will be described further below, the harvesting process 455 periodically harvests images that sellers have associated with items in the listing database 420. After a set of images have been harvested and thumbnailized, the harvesting process 455 notifies the thumb server 430 that new thumbnails are available.

The thumb server 430 includes a thumbnail management process 435, a thumb database 440 and one or more backup databases 445. Clients 470 interact with the thumbnail management process 435 to receive image data associated with the Gallery format. When new thumbnails are available, the thumbnail management process 435 makes a backup copy of the current thumb database 440, receives a copy of a new database from the thumb building machine 450, and begins serving thumbnail images from the new database.

Importantly, as one feature of the present embodiment, thumbnail images are not stored as individual files; rather, they are stored in an efficient database format that will be described further below. However, at this point, a justification for such an approach is worth mentioning. In the context of an online commerce site that may process tens of thousands of new items every day, efficiency and stability are key considerations. The practicality of storing and maintaining thousands upon thousands of individual compressed thumbnail image files is questionable at best. It is thought that existing operating systems would become unstable and/or fail to work properly if millions of thumbnail images were stored in various places on the disk as individual files cluttering the file system. Therefore, rather than maintaining a complex file structure with potentially millions of separate files, according to one embodiment of the present invention an efficient database is maintained that is designed to get information into memory quickly to provide fast access to the thumbnail images stored therein.

Note that in this description, in order to facilitate explanation, the thumb building machine 450, the listing server 410, and the thumb server 430 are generally discussed as if they were each a single device. However, each of the thumb building machine 450, the listing server 410, and the thumb server 430 may actually comprise multiple physical and/or logical devices connected in a distributed

architecture, and the various functions performed may actually be distributed among multiple devices. Additionally, in alternative embodiments, the functions performed by the various servers may be consolidated and/or distributed differently than as described. For example, any function can be implemented on any number of machines or on a single machine. Also, any process may be divided across multiple machines.

#### Item Maintenance

Having briefly described exemplary interactions among various devices in which features of the present invention may be implemented, item maintenance processing will now be described with reference to FIG. 5. In general, item maintenance comprises three activities: creating and modifying items, harvesting images to be associated with the items, and presenting items to prospective buyers.

At step 510, depending upon user interactions with the various servers, appropriate processing is performed. If a user request is received to add a new item, then processing continues with step 520. If a user query is received, e.g., a query specifying a category and a page, then processing continues with step 540. Various events may also trigger item maintenance processing. For example, according to the embodiment illustrated, upon expiration of a predetermined harvesting interval, processing continues with step 530. In alternative embodiments, harvesting may be performed on a periodic basis or continuously.

At step 520, item registration processing is performed. According to one embodiment, an HTML form, such as the one illustrated in FIG. 6, is supplied to the user. When the completed form is submitted to the listing server 410, the listing management process 415 updates the listing database 420 to include the new item.

At step 530, the harvesting process 455 downloads user-specified images associated with newly listed items to its local database 460. New items may be identified, for example, by a periodic scan of the listing database by either of the listing management process 415 or the harvesting process 455. The harvesting process 455 may also periodically reload images and update thumbnails associated with items that are not new to accommodate subsequent user modification. For example, a user may change the originally specified image or provide a new URL to be associated with an item for sale. Further details regarding harvesting are described below.

At step 540, item presentation processing is performed. According to one embodiment responsive to a user request, e.g., a query specifying a category and a page number, the listing management process 415 generates HTML describing to the user's browser how to gather and compose the web page. As will be described further below, the HTML may contain image tags referencing thumbnail images stored in the thumb database 440. An exemplary Gallery format, an item presentation format that incorporates thumbnails for fast preview, is illustrated in FIG. 9.

#### Item Registration

FIG. 6 is an exemplary registration form 600 that may be used during item registration. To sell an item on an online commerce site, typically the seller first registers the item to be sold. In this context, the act of registering simply refers to the process of supplying information about the item so that the information may be presented to prospective purchasers responsive to their requests and/or queries.

Upon receiving a request to add a new item, the listing management process 415 may respond with an HTML form, such as registration form 600. The registration form 600 may include a variety of standard HTML form interface

elements, including text input fields, checkboxes, radio buttons, and popup menus, for example. The most important piece of information for purposes of this application is the picture URL 650. The picture URL 650 text input field allows a seller to specify an image of his/her choice to be associated with the item being registered. Note, that no additional information regarding the image is necessary. Advantageously, in this manner, the user need not worry about supplying an image in a particular format or one that is limited to a particular size. As will be described further below, the harvesting process 455 automatically downloads the specified image, converts it to the appropriate format, and scales it to the appropriate size that is appropriate for use with the Gallery presentation mechanism.

The seller also provides his/her user ID or email address 605 and a password 610 in form 600. According to this example, the seller additionally submits a descriptive title 615 for the item and a geographical location 620 of the item. Providing the location 620 of the item allows prospective buyers to evaluate potential costs relating to shipping, etc. In order for the item to show up in user queries for a particular category, the seller also selects one of a number of categories 625 and chooses the most specific sub-categories from a predefined list in a popup menu, for example. Finally, the seller may specify acceptable payment methods 630, shipping terms 640, the quantity 655 of items of this type that are available, a minimum bid 660 per item, and the duration 665 of the offer. When the item is posted to the listing database 420 a unique item number is generated and associated with the item. The item numbers may be sequentially numbered as new items are posted to the listing database 420, for example.

The present invention is not limited to any particular implementation of registration processing or to the specific information that may be associated with an item for sale. Importantly, the registration form 600 is intended only to illustrate some of the many types of information that may be associated with an item that is posted to the listing database 420. In alternate embodiments, more or less information may be associated with items.

#### Image Harvesting

FIG. 7 is a flow diagram illustrating image harvesting processing according to one embodiment of the present invention.

At step 710, image location information is retrieved from the listing database 420 for a set of images that will be downloaded concurrently. According to one embodiment, the image location information is a URL. However, other mechanisms are envisioned for specifying an image location, such as a directory path, etc.

At step 720, an attempt is made to convert erroneous user-supplied data to "legal" data. For example, the user-supplied data for the image location may be massaged to have correct URL syntax. URLs follow the syntax described in Request for Comments (RFC) 1738, Uniform Resource Locators (URL), December 1994. According to RFC 1738, a URL contains the name of the "scheme" being used (e.g., http, ftp, gopher, etc.) followed by a colon and then a string, the "scheme-specific part" whose interpretation depends on the scheme. URLs are, therefore, written as follows:

<scheme>:<scheme-specific part>

For example, the eBay home page is currently located at the following URL: "http://www.ebay.com". The scheme is "http" and the scheme-specific part is "www.ebay.com".

At step 730, multiple image downloads are started using a sockets-based interface. Prior to starting the downloads, it

may be necessary to attempt a variety of option configurations in order to establish communication with a particular server.

At any rate, assuming communication has successfully been established with the servers that have the desired image data, in one embodiment, 500 downloads are performed concurrently. After the downloads have begun, the status of the downloads is polled periodically (step 740). If an error arose in one or more of the downloads, processing continues with step 750. If one or more of the downloads has completed, then processing continues with step 760.

At step 750, error handling is performed. Attempts may be made to determine whether or not an error has in fact occurred. For example, it is not uncommon for a server to incorrectly identify a file size thereby causing a mismatch between the actual size of the downloaded file and the expected file size. In situations like these, the image can be salvaged; however, other situations may require the download to be restarted.

At step 760, the one or more images that have been downloaded successfully are thumbnailled and stored for later inclusion in the thumbnail database 440. According to one embodiment, the process of thumbnailing an image is performed with an imaging tool kit, such as ImageGear98 Gold Pro of Accusoft. Thumbnailing an image may be broken down into three steps: (1) first, decompression is performed from the harvested image's source format; (2) then, the decompressed image is converted to a thumbnail that will fit within a predetermined space. For example, the largest dimension of the source image may be scaled to fit the corresponding dimension of the predetermined space, then the other dimension of the source image may be scaled proportionately; (3) finally, the thumbnail is recompressed into a predetermined output format, e.g., Joint Photographic Expert Group (JPEG).

Preferably, for convenience of the users, the thumbnailing process may receive one of many different image formats. According to one embodiment, the source format and the output format are one of the following: Tagged Image File Format (TIFF), JPEG, JPEG 12 Lossy, JPEG 12-8 Lossless, P-JPEG, Audio Video Interleave (AVI), (JPEG File Interchange Format) JFIF, Delrin Winfax, PCX (ZSoft Paint format), TGA (Truevision (Targa) File Format), Portable Network Graphics (PNG), DCX, G3, G4, G3 2D, Computer Aided Acquisition and Logistics Support Raster Format (CALS), Electronic Arts Interchange File Format (IFF), IOCA, PCD, IGF, ICO, Mixed Object Document Content Architecture (MO:DCA), Windows Metafile Format (WMF), ATT, Windows Bitmap Format (BMP), BRK, CLP, LV, GX2, IMG(GEM), IMG(Xerox), IMT, KFX, FLE, MAC, MSP, NCR, Portable Bitmap (PBM), Portable Grey-map (PGM), SUN, PNM, Portable Pixmap (PPM), Adobe Photoshop (PSD), Sun Rasterfile (RAS), SGI, X BitMap (XBM), X PixMap (XPM), X Window Dump (XWD), AFX, Imara, Exif, WordPerfect Graphics Metafile (WPG), Macintosh Picture (PICT), Encapsulated PostScript (EPS), Graphics Interchange Format (GIF). Of course, as new image formats are introduced, it would be advantageous to provide support for those as well.

#### Item Presentation

FIG. 8 is a flow diagram illustrating item presentation processing according to one embodiment of the present invention. The assignee of the present invention has observed that in the context of item presentation only a small amount of information actually needs to be changed in the HTML that is generated for various user queries. For an item presentation format, such as that illustrated in FIG. 9, the

information that varies is essentially limited to: the item title, the current minimum bid, the image, and the auction ending time. The remainder of the web page comprises HTML interface elements that remain constant regardless of the result of the user's query. Consequently, according to one embodiment, a predefined page format (referred to as the Gallery template) is employed into which the information that varies can be inserted on the fly as data is retrieved from the databases.

At step 810, the predefined page format, e.g., the Gallery template, is obtained.

At step 820, the listing management process 415 retrieves information from the listing database 420 corresponding to the items that will be displayed for the category and page requested, for example.

At step 830, the predefined page format is populated based upon the information retrieved in step 820. At this point, it should be noted that according to one embodiment of the present invention, thumbnail images are accessed from the thumb server 430 by item number. As one feature of this embodiment, references to the thumbnail images stored on the thumb server 430 may be generated on the fly by the listing management process 415 based upon the image format and the item number. For example, an inline image tag can be generated having the general form: `<img src=path/item_number.jpg>`. In this manner, no additional space is required in the listing database 420 for image file names. Another option would have been to represent the image reference in the form of a query, e.g., `http://cgi.ebay.com/cgi/DBAPI.dll?GetImage&item=item_number`. However, while the former representation would be cached by caching proxy servers, the latter representation is not typically cached by caching proxy servers. Therefore, hiding the underlying queries to the thumb database 440 from caching proxy servers by representing the thumbnail images in the HTML as if they were stored as individual files has the benefit of causing the caching proxy servers to perform more efficiently thereby generally reducing the load on the site and making the experience better for all users. Additionally, users that access the listing server 410 and the thumb server 430 by way of a caching proxy server, such as those on America Online, for example, will have enhanced performance as a result of the thumbnail images being cached because the data for rendering the web pages will be available much faster.

#### Gallery Presentation Format

FIG. 9 is an example of an item presentation format for an online person-to-person trading site according to one embodiment of the present invention. The Gallery presentation page format 900 of the present embodiment includes a text mode button 975 and a photo mode button 980 allowing the user to switch between the text-based item listing format and the Gallery presentation format. In response to a user query, such as a request for a particular page 970 within a particular category 960, a list of items 905 is displayed to the users. In this example, each individual item 910 includes a thumbnail image 920, a title 915, a current minimum bid 930, and the auction ending time 950. Advantageously, in this manner, the Gallery presentation page format 900 allows a prospective buyer to quickly scan the thumbnails for items of interest. Such a feature becomes critical in an online commerce environment in which thousands of unique items are for sale, for example.

According to another feature of the present embodiment, by displaying all images in a predetermined, fixed-size display area 921, the listing management process 415 doesn't need to have detailed knowledge about the indi-

vidual images. For example, according to an embodiment described previously, the listing management process 415 can simply use the item number to generate references, e.g., inline image tags, for the desired thumbnail images.

#### Thumb Database Access

FIG. 10 illustrates memory mapped file access to the thumb database 1020 according to one embodiment of the present invention. According to the embodiment depicted, rather than maintaining a complex file structure with potentially millions of separate files, a simple and efficient thumb database 1020 is maintained that is designed to get information into memory quickly to provide fast access to the thumbnail images stored therein. Briefly, the goal is to keep the thumb database 1020 reasonably sized so that it can be completely loaded into a virtual address space 1015 and accessed as a memory mapped file.

According to one embodiment, each database entry comprises a length field and image data. The length field may identify the length of the entry or the length of the image data. The image data represents the compressed thumbnail image. For purposes of this example, it is assumed the thumb server has a 4 Gigabyte virtual address space and that the thumb database 1020 can be compressed into a single 1 Gigabyte file. When the thumbnail management process 435 opens the thumb database 1020 for reading; rather than using file system calls that would not provide sufficient caching, it opens the thumb database 1020 as a memory mapped file. As a result, the thumb database is loaded completely into a continuous block 1025 of the virtual address space 1015. Accessing an individual entry of the database may then be accomplished by selecting an offset corresponding to the desired image from an array of relative offsets, such as index 1010. Advantageously, after the thumb database 1020 is loaded into virtual address space 1015, disk I/O can be avoided for subsequent accesses thereby enhancing the speed at which images can be served to clients.

In the foregoing specification, the invention has been described with reference to specific embodiments thereof. It will, however, be evident that various modifications and changes may be made thereto without departing from the broader spirit and scope of the invention. The specification and drawings are, accordingly, to be regarded in an illustrative rather than a restrictive sense.

What is claimed is:

1. A method performed by a marketplace computer for facilitating electronic commerce over a network between a plurality of seller and buyer computers, the method comprising the steps of:

presenting a registration web page to a remote first seller computer over the network;

receiving a first registration for a first product from the first seller computer over the network, the first registration including a first product description and a first Universal Resource Locator (URL) indicating a first location of a first image of the first product, the first location referencing the first seller computer or a third computer on the network, and the first image being in one of a plurality of predetermined source image formats;

presenting a registration web page to a remote second seller computer over the network;

receiving a second registration for a second product from the second seller computer over the network the second registration including a second product description and a second URL indicating a second location of a second image of the second product, the second location referencing the second seller computer or a fourth com-

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puter on the network, and the second image being in one of a plurality of predetermined source image formats;  
retrieving the first image based on the received first URL;  
manipulating the first image to produce a first thumbnail image of a first predetermined size and format;  
retrieving the second image based on the received second URL;  
manipulating the second image to produce a second thumbnail image of a second predetermined size and format;

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creating a customized web page including the first and second thumbnail images; and

presenting the customized web page to a buyer computer.

2. The method of claim 1, wherein the first and second predetermined sizes are the same, and the first and second predetermined formats are the same.

3. The method of claim 1, wherein the customized web page further includes the first and second product descriptions.

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